Project Management

THE MANAGERIAL PROCESS

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Third Edition

Chapter 4

Defining the Project

PowerPoint Presentation by Charlie Cook

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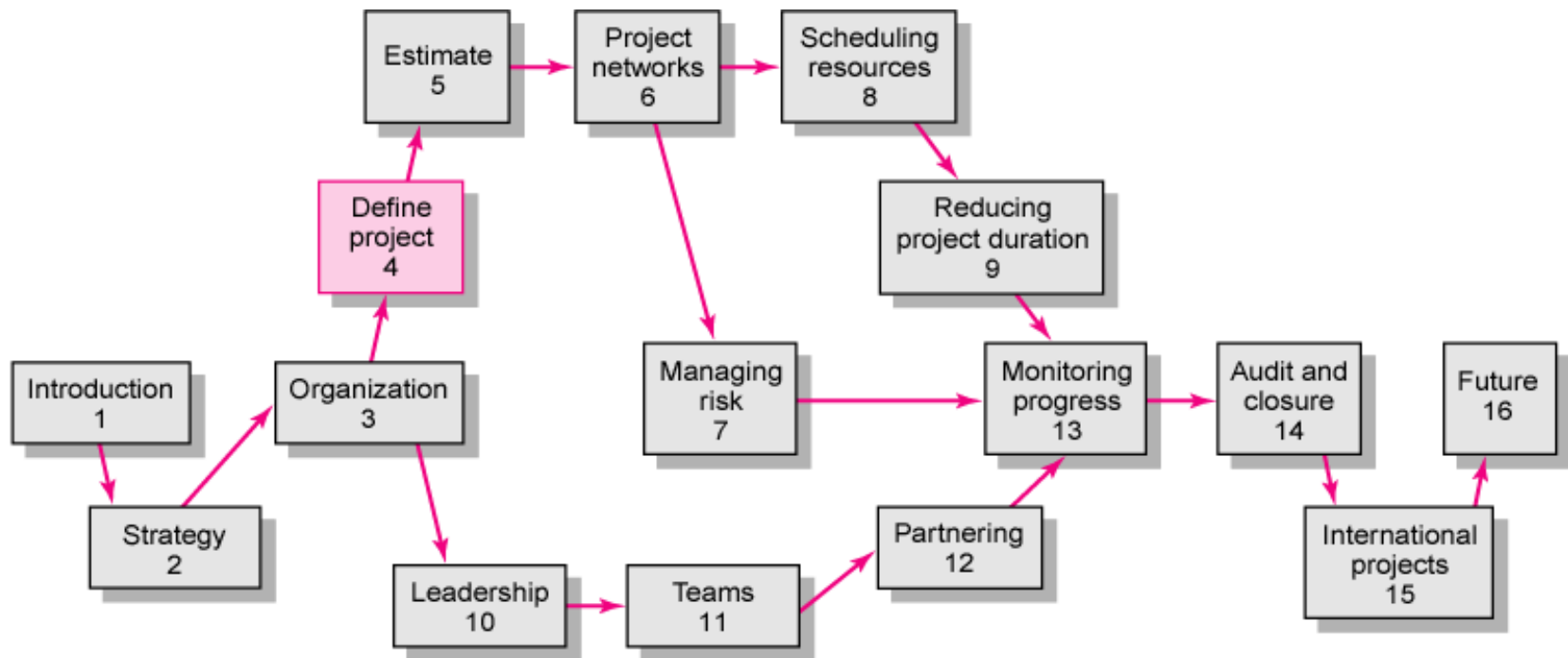
Defining the Project

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

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.

Project Scope Checklist

1. Project objective

2. Deliverables

3. Milestones

4. Technical requirements

5. Limits and exclusions

6. Reviews with customer

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.

- **Project Creep**
  - The tendency for the project scope to expand over time due to changing requirements, specifications, and priorities.

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 parameter over others.
  - Accept: reducing (or not meeting) a parameter requirement.
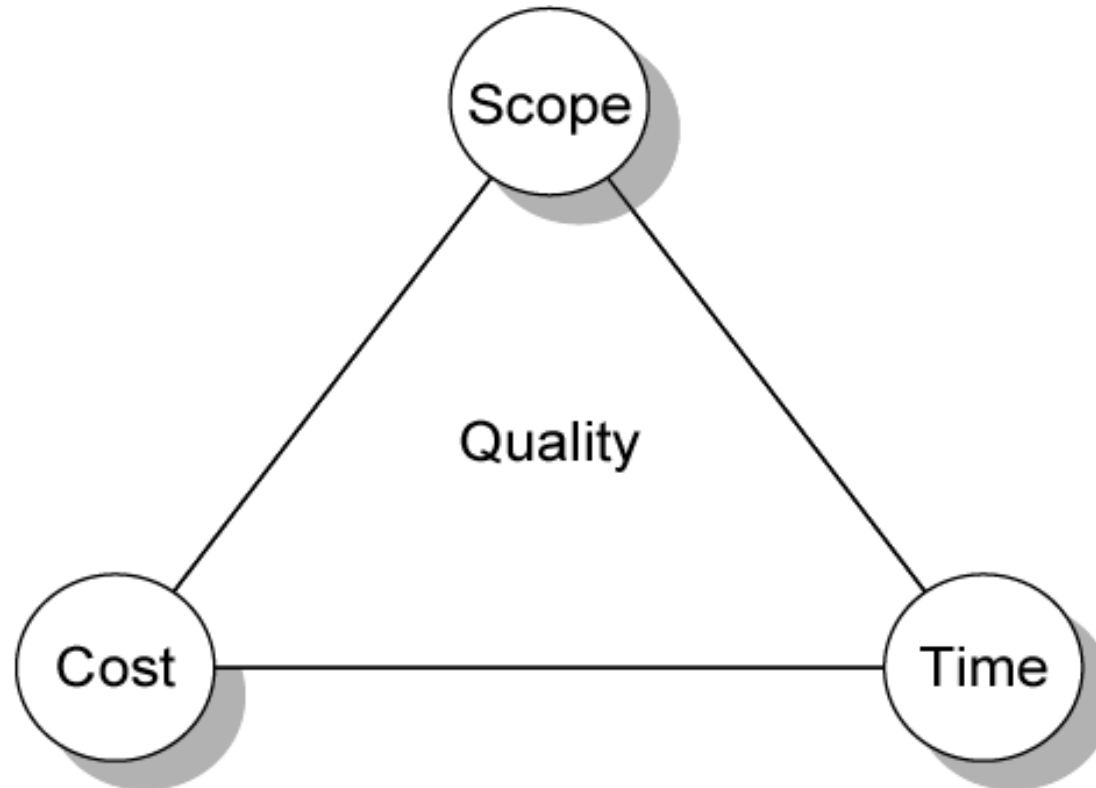
Project Management Trade-offs

Scope

Quality

Cost

Time

FIGURE 4.1

Project Priority Matrix

	Time	Performance	Cost
Constrain		●	
Enhance	●		
Accept			●

FIGURE 4.2

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.

Level	Hierarchical breakdown	Description
1	Project	Complete project
2	Deliverable	Major deliverables
3	Subdeliverable	Supporting deliverables
4	Lowest subdeliverable	Lowest management responsibility level
5	Cost account*	Grouping of work packages for monitoring progress and responsibility
	Work package	Identifiable work activities
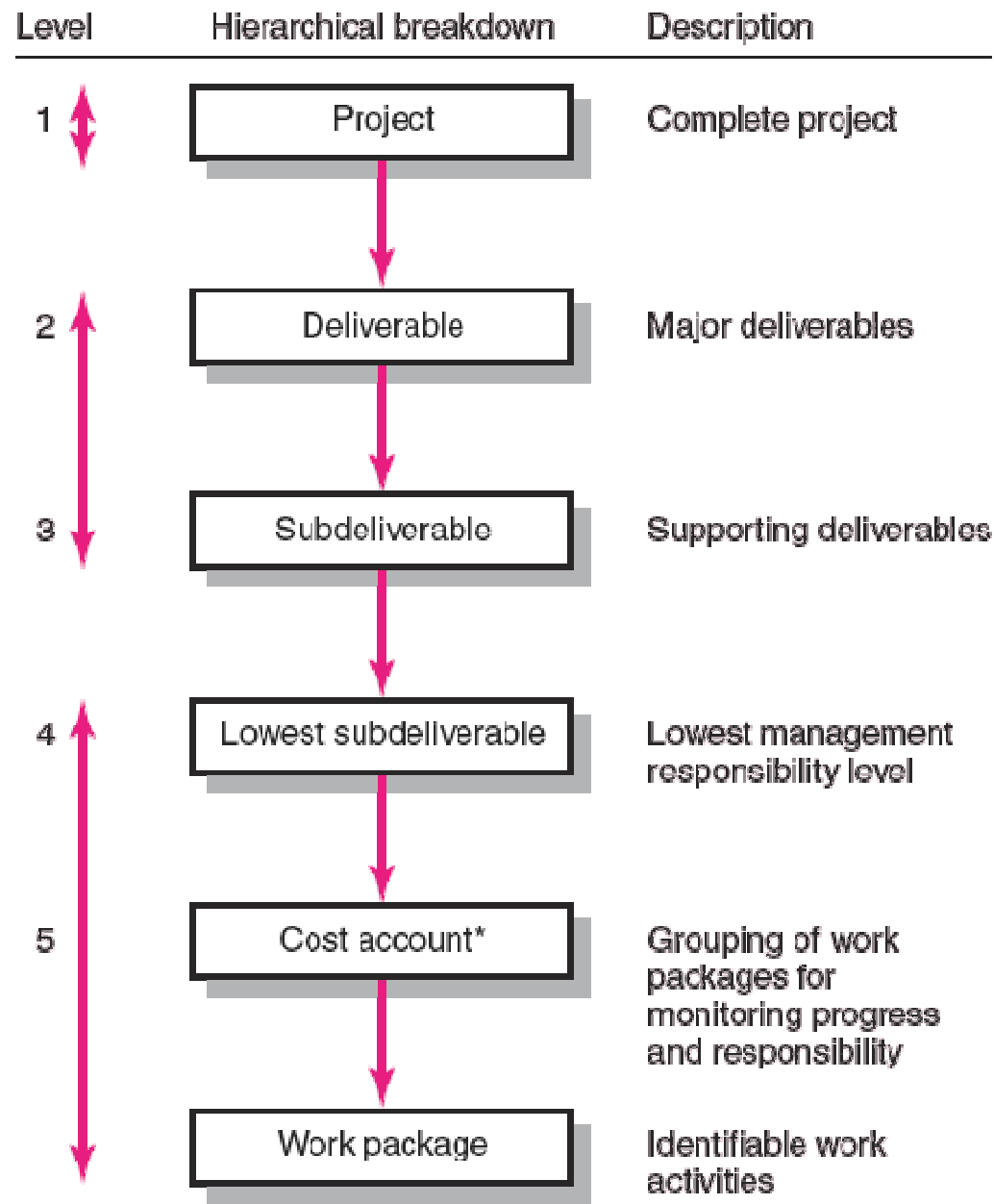
Hierarchical Breakdown of the WBS

FIGURE 4.3

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.

Work Breakdown Structure

Level						
1			Personal computer prototype			→ More items
2	Vendor, software, applications	Mouse, keyboard, voice	Disk storage units		Microprocessor unit	
3			Floppy / Optical / Hard		Internal memory unit / BIOS (basic input/output system)	
4					ROM / RAM / I/O / File / Utilities	

Lowest manageable subdeliverables →

5	Motor	Circuit board	Chassis frame	Read/write head

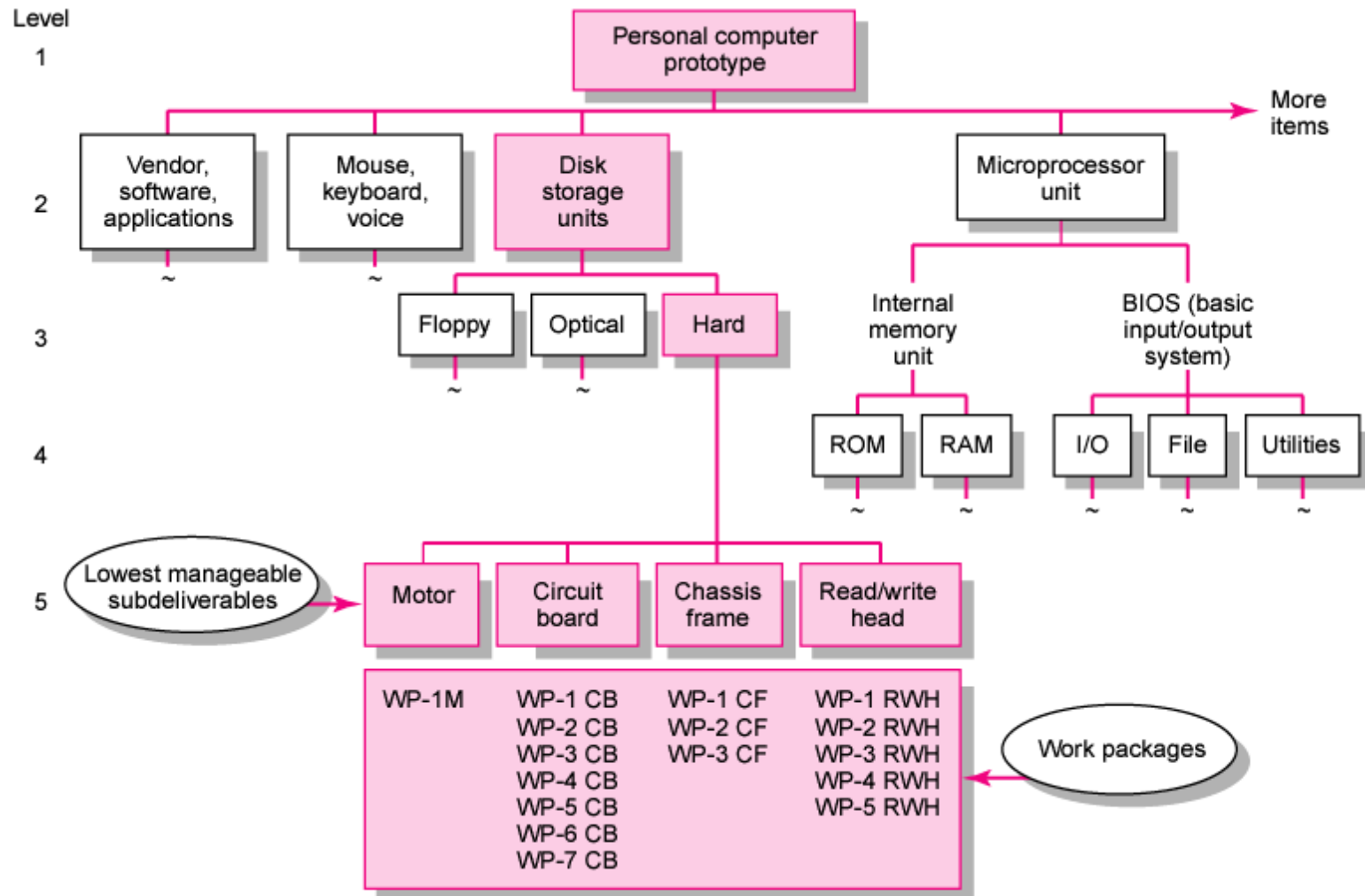| WP-1M	WP-1 CB	WP-1 CF	WP-1 RWH
	WP-2 CB	WP-2 CF	WP-2 RWH
	WP-3 CB	WP-3 CF	WP-3 RWH
	WP-4 CB		WP-4 RWH
	WP-5 CB		WP-5 RWH
	WP-6 CB		
	WP-7 CB		

← Work packages

FIGURE 4.4

Work Packages

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

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 the organizational units to cost control accounts.
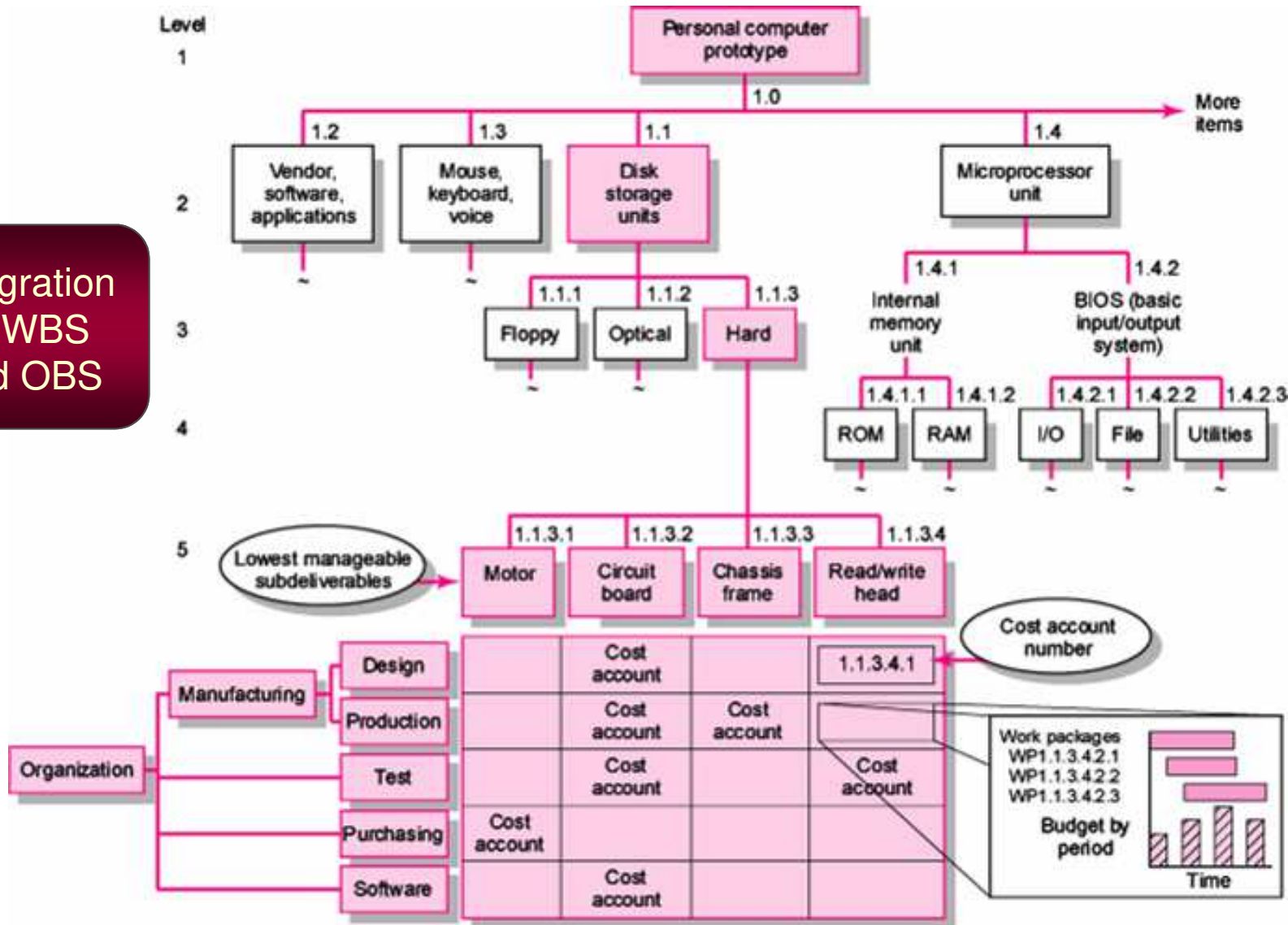
Integration of WBS and OBS

Level 1 — Personal computer prototype (1.0) — More items

- 1.2 Vendor, software, applications
- 1.3 Mouse, keyboard, voice
- 1.1 Disk storage units
- 1.4 Microprocessor unit

Level 3:
- 1.1.1 Floppy
- 1.1.2 Optical
- 1.1.3 Hard
- 1.4.1 Internal memory unit
- 1.4.2 BIOS (basic input/output system)

Level 4:
- 1.4.1.1 ROM
- 1.4.1.2 RAM
- 1.4.2.1 I/O
- 1.4.2.2 File
- 1.4.2.3 Utilities

Level 5 — Lowest manageable subdeliverables:
- 1.1.3.1 Motor
- 1.1.3.2 Circuit board
- 1.1.3.3 Chassis frame
- 1.1.3.4 Read/write head

Cost account number: 1.1.3.4.1

Organization:
- Manufacturing
  - Design — Cost account
  - Production — Cost account, Cost account
  - Test — Cost account, Cost account
  - Purchasing — Cost account
  - Software — Cost account

Work packages
WP1.1.3.42.1
WP1.1.3.42.2
WP1.1.3.42.3

Budget by period

Time

FIGURE 4.5

Direct Labor Budget Sorted By WBS

		Direct Labor Budget	
1.1.3	Hard drive	1,660	
1.1.3.1	Motor	10	
	Purchasing		10
1.1.3.2	Circuit board	1,000	
	Design		300
	Production		400
	Testing		120
	Software		180
1.1.3.3	Chassis frame	50	
	Production		50
1.1.3.4	Read/write head	600	
	Design		300
	Production		200
	Testing		100

TABLE 4.1A

Direct Labor Budget Sorted by OBS

		Direct Labor Budget	
Design		600	
1.1.3.2	Circuit board		300
1.1.3.4	Read/write head		300
Production		650	
1.1.3.2	Circuit board		400
1.1.3.3	Chassis frame		50
1.1.3.4	Read/write head		200
Testing		220	
1.1.3.2	Circuit board		120
1.1.3.4	Read/write head		100
Purchasing		10	
1.1.3.1	Motor		10
Software		180	
1.1.3.2	Circuit board		180
Total		1,660	

TABLE 4.1B

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

ID	Task Name
1	**1 Computer project**
2	**1.1 Disk Storage units**
3	1.1.1 Floppy
4	1.1.2 Optical
5	**1.1.3 Hard**
6	**1.1.3.1 Motor**
7	1.1.3.1.1 Sourcing work package
8	1.1.3.1.2*
9	1.1.3.1.3*
10	1.1.3.1.4*
11	**1.1.3.2 Read/write head**
12	1.1.3.2.1 Cost account
13	1.1.3.2.2 Cost account
14	1.1.3.2.3 WP
15	1.1.3.2.4 WP
16	1.1.3.2.5 WP
17	1.1.3.2.6 Cost account
18	1.1.3.2.7*
19	1.1.3.2.8*
20	1.1.3.2.9*

WBS Coding

Work Package Estimates

WP Description __Final version__   Page __1__ of __1__

WP ID __1.1.3.2__   Project __PC proto__

Deliverable __Circuit board__   Date __9/29/XX__

Original Unit __Software__   Estimator __RMG__

WP Duration __3__ work weeks   Total Budget $ __265__

Time-Phased Budget ($)

Work periods

Labor costs	Rate	1	2	3	4	5	Total
Code	$ XX/hr	50	30	20			$100
Document	$ XX/hr		10	15			25
Publish	$ XX/hr			5			5
Total labor		50	40	40			$130
Materials			20				20
Equipment	$ XX/hr	50	15	50			115
Other _____							
Total direct		100	75	90			$265

FIGURE 4.6

Project Roll-up

- Cost Account

  – The intersection of the WBS and the OBS that is a budgetary control point for work packages.

  – Used to provide a roll-up (summation) of costs incurred over time by a work package across organization units and levels, and by deliverables.
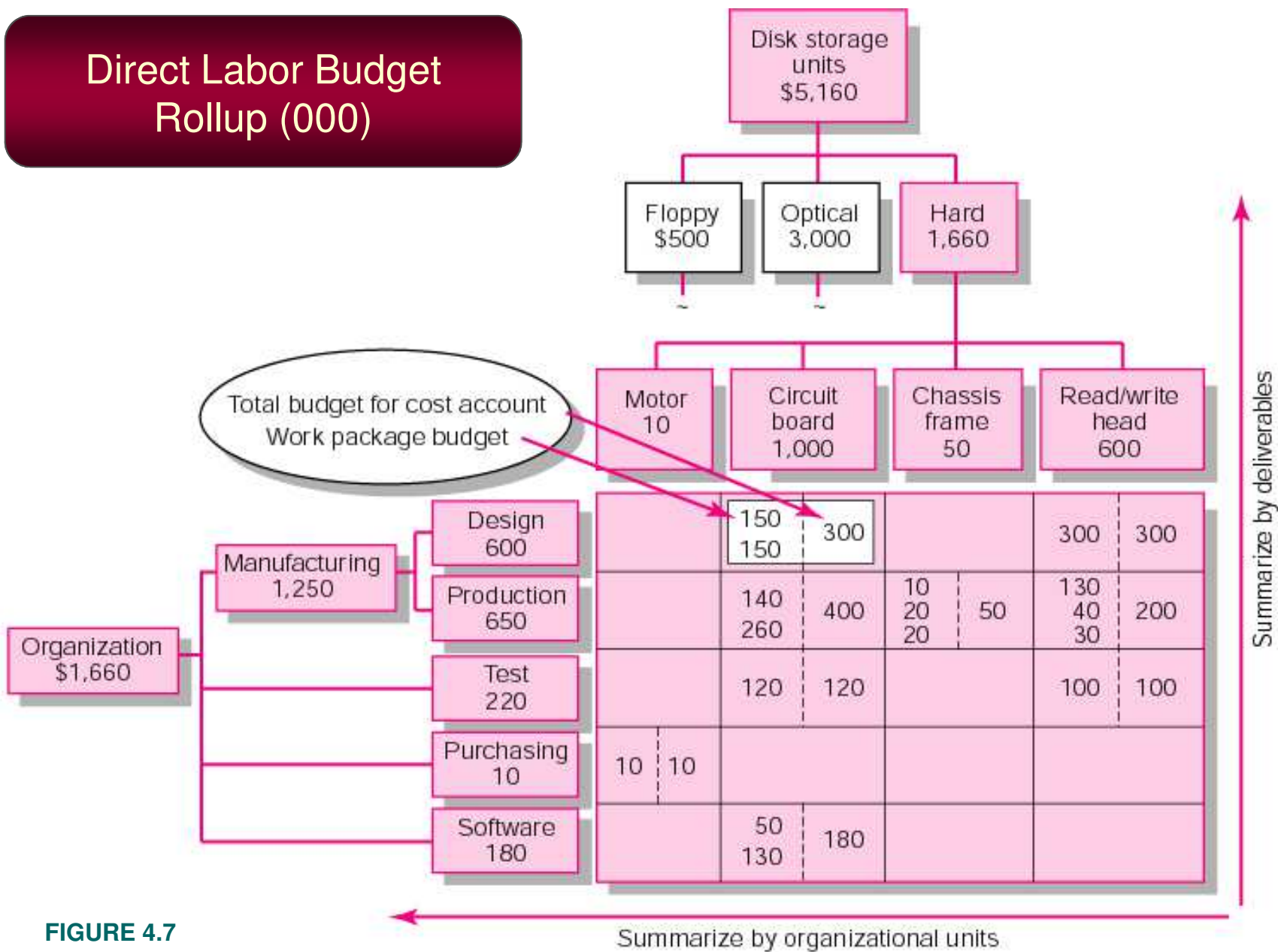
Direct Labor Budget Rollup (000)

Disk storage units $5,160

Floppy $500   Optical 3,000   Hard 1,660

Total budget for cost account
Work package budget

Motor 10   Circuit board 1,000   Chassis frame 50   Read/write head 600

Summarize by deliverables

Organization $1,660	Manufacturing 1,250	Design 600		150 150	300			300	300
		Production 650		140 260	400	10 20 20	50	130 40 30	200
		Test 220		120	120			100	100
		Purchasing 10	10	10					
		Software 180		50 130	180				

Summarize by organizational units

FIGURE 4.7

Process Breakdown Structure

- ## Process-Oriented Projects

  - –Are driven by performance requirements in which the final outcome is the product of a series of steps of phases in which one phase affects the next phase.

- ## Process Breakdown Structure (PBS)

  - –Defines deliverables as outputs required to move to the next phase .

  - –Checklists for managing PBS:

    - Deliverables needed to exit one phase and begin the next.

    - Quality checkpoints for complete and accurate deliverables.

    - Sign-offs by responsible stakeholders to monitor progress.
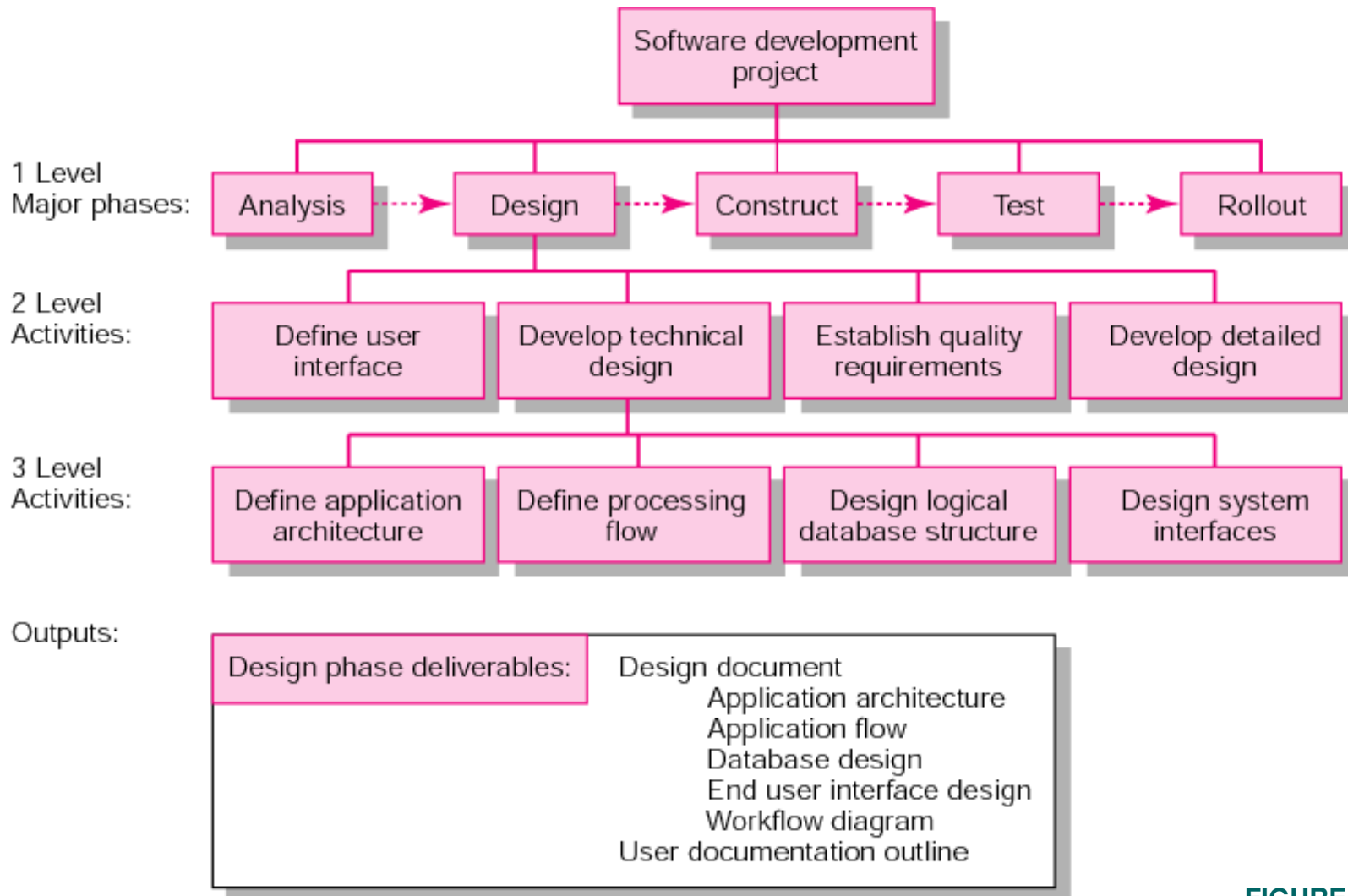
PBS for Software Project Development

Software development project

1 Level Major phases: Analysis → Design → Construct → Test → Rollout

2 Level Activities:
- Define user interface
- Develop technical design
- Establish quality requirements
- Develop detailed design

3 Level Activities:
- Define application architecture
- Define processing flow
- Design logical database structure
- Design system interfaces

Outputs:

Design phase deliverables:
- Design document
- Application architecture
- Application flow
- Database design
- End user interface design
- Workflow diagram
- User documentation outline

FIGURE 4.8

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 4.9

Responsibility Matrix for the Conveyor Belt Project

Deliverables	Design	Development	Documentation	Assembly	Testing	Purchasing	Quality Assur.	Manufacturing
Architechural design	1	2			2		3	3
Hardware specifications	2	1				2	3	
Kernel specifications	1	3						3
Utilities specification	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

Organization (column group header over Design through Manufacturing)

1 Responsible
2 Support
3 Consult
4 Notification
5 Approval

FIGURE 4.10

Key Terms

Cost account

Milestone

Organization breakdown structure (OBS)

Scope creep

Priority matrix

Responsibility matrix

Scope statement

Process breakdown structure (PBS)

Work breakdown structure (WBS)

Work package