

# Announcement

- MS project 2013 tutorials → under Course Materials / Week 4 on Canvas.

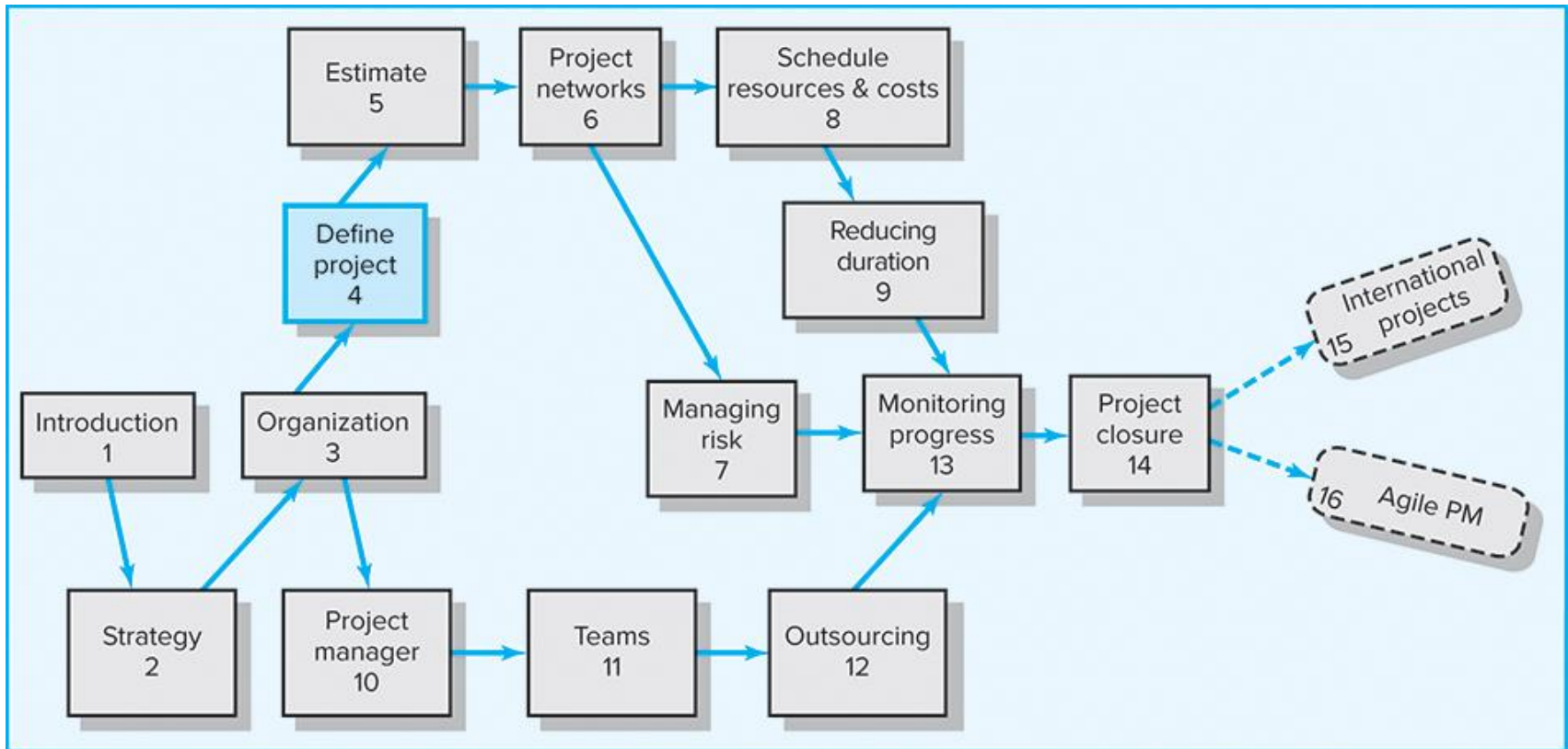
## Previously ...

- We looked at the various types of Project Management Structures
  - Functional / Project / Matrix
  - The choice is influenced by the type of structure and the organizational culture
- We looked at Organizational Culture and its importance to projects
- We now look at defining the project – e.g., what is to be done

# Chapter Four

## Defining the Project

# Where We Are Now



# Learning Objectives

1. Understand why it is important to establish project priorities in terms of cost, time, and performance
2. Demonstrate the importance of a work breakdown structure (WBS) to the management of projects and how it serves as a data base for planning and control
3. Demonstrate how the organization breakdown structure (OBS) establishes accountability to organizational units
4. Describe a process breakdown structure (PBS) and when to use it
5. Create responsibility matrices for small projects
6. Create a communication plan for a project

# Chapter Outline

1. Work Breakdown structure by 5 generic steps
2. Process Breakdown Structure
3. Responsibility Matrices
4. Project Communication Plan

# 1. Work Breakdown Structure

- Structured method for selectively collecting information to meet the needs of all stakeholders (e.g., customer, project manager)
- All tasks are identified
- Participants of the project have an understanding of what is to be done.
- The FIVE generic steps
  - for developing a work breakdown structure

# 1. Work Breakdown Structure

Step 1: Defining the Project Scope

Step 2: Establishing Project Priorities

Step 3: Creating the Work Breakdown Structure  
(**WBS**)

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
  - **Scope:** what you expect to deliver to your customer when the project is complete
- Purposes of the Project 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

## Step 1: Defining the Project Scope

# Project Scope Checklist

- a. Project objective
- b. Deliverables
- c. Milestones
- d. Technical requirements
- e. Limits and exclusions
- f. Reviews with customer



## Step 1: Defining the Project Scope

# Project Scope Checklist

### a. Project objective

Develop a program that automatically translate verbal sentences in English to Russian within three years at a cost not to exceed \$1.5 million.

### b. Deliverables

### c. Milestones

### d. Technical requirements

### e. Limits and exclusions

### f. Reviews with customer

## Step 1: Defining the Project Scope

# Project Scope Checklist

a. Project objective

b. Deliverables

1<sup>st</sup> phase: a list of specification

2<sup>nd</sup> phase: software coding and a technical manual

3<sup>rd</sup> phase: prototypes

4<sup>th</sup> phase: approved software

c. Milestones

d. Technical requirements

e. Limits and exclusions

## Step 1: Defining the Project Scope

# Project Scope Checklist

- a. Project objective
- b. Deliverables
- c. Milestones
  - e.g, Testing complete and finished by July 1 of the same year
  - Should be important control points in the project
- d. Technical requirements
- e. Limits and exclusions
- f. Reviews with customer

## Step 1: Defining the Project Scope

# Project Scope Checklist

- a. Project objective
- b. Deliverables
- c. Milestones
- d. Technical requirements
  - A personal computer: 120-volt alternating current or 240 volt direct current
  - Speed and capacity of database systems
- e. Limits and exclusions
- f. Reviews with customer

## Step 1: Defining the Project Scope

# Project Scope Checklist

- a. Project objective
- b. Deliverables
- c. Milestones
- d. Technical requirements
- e. Limits and exclusions
  - Why do we need the limit of scope? To prevent False expectation: resources and time on the wrong problem
  - e.g., local air transportation to and from base camps will be outsourced
  - e.g., client will be billed for additional training beyond that prescribed in the contract.
- f. Reviews with customer

## Step 1: Defining the Project Scope

# Project Scope Checklist

- a. Project objective
- b. Deliverables
- c. Milestones
- d. Technical requirements
- e. Limits and exclusions
- f. Reviews with customer: *completion of the scope checklist ends with a review with your customer*
  - Understanding and agreement of expectations
  - e.g., Is the customer getting what he or she desires in deliverable?



# Step 1: Defining the Project Scope

## Project Scope Checklist



### PROJECT OBJECTIVE

To construct a high-quality, custom home within five months at cost not to exceed \$350,000.

### DELIVERABLES

- A 2,200-square-foot, 2½-bath, 3-bedroom, finished home.
- A finished garage, insulated and sheetrocked.
- Kitchen appliances to include range, oven, microwave, and dishwasher.
- High-efficiency gas furnace with programmable thermostat.

### MILESTONES

1. Permits approved—March 5
2. Foundation poured—March 14
3. Drywall in. Framing, sheathing, plumbing, electrical, and mechanical inspections passed—May 25
4. Final inspection—June 7

### TECHNICAL REQUIREMENTS

1. Home must meet local building codes.
2. All windows and doors must pass NFRC class 40 energy ratings.

3. Exterior wall insulation must meet an “R” factor of 21.
4. Ceiling insulation must meet an “R” factor of 38.
5. Floor insulation must meet an “R” factor of 25.
6. Garage will accommodate two large-size cars and one 20-foot Winnebago.
7. Structure must pass seismic stability codes.

### LIMITS AND EXCLUSIONS

1. The home will be built to the specifications and design of the original blueprints provided by the customer.
2. Owner responsible for landscaping.
3. Refrigerator is not included among kitchen appliances.
4. Air conditioning is not included but rewiring is included.
5. Contractor reserves the right to contract out services.
6. Contractor responsible for subcontracted work.
7. Site work limited to Monday through Friday, 8:00 A.M. to 6:00 P.M.

### CUSTOMER REVIEW

John and Joan Smith

## Step 1: Defining the Project Scope

# Project Scope: Terms and Definitions

- Scope Statements
  - Also called statements of work (SOW)
- Project Charter
  - A document authorising the project manager to initiate and lead the project
  - Issued by upper management and provides the project manager with written authority to use organizational resources for project activities.

## Step 1: Defining the Project Scope

# Project Scope: Terms and Definitions

- Scope Creep: Many projects suffer from it (added cost, project delays)
  - The tendency for the project scope to **expand** over time due to changing requirements, specifications, and priorities
  - It is the “minor refinements” that eventually build to be major scope changes that can cause problems



## Step 1: Defining the Project Scope

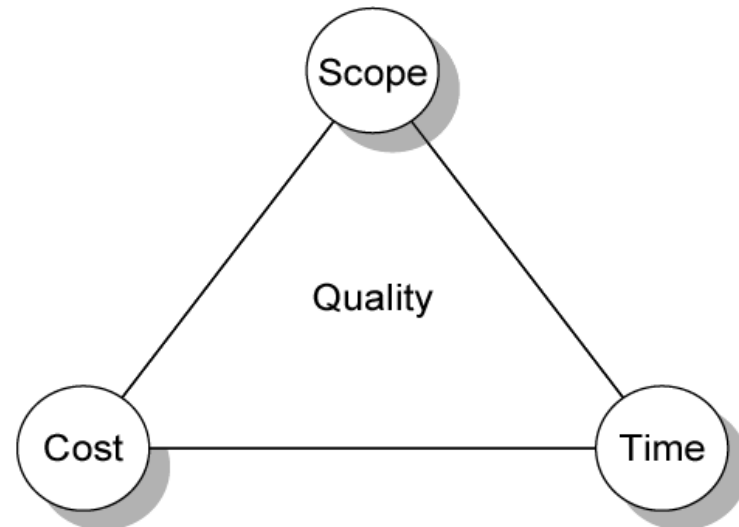
# Project Scope: Terms and Definitions

- Scope Creep: Many projects suffer from it (added cost, project delays)
  - Scope creep means added costs and possible project delays.
  - Scope creep can be reduced by carefully writing your scope statement.






# Step 2: Establishing Project Priorities

- Causes of Project Trade-offs
  - Shifts in the relative importance of criteria related to cost, time, and performance parameters
    - Budget–Cost
    - Schedule–Time
    - Performance–Scope

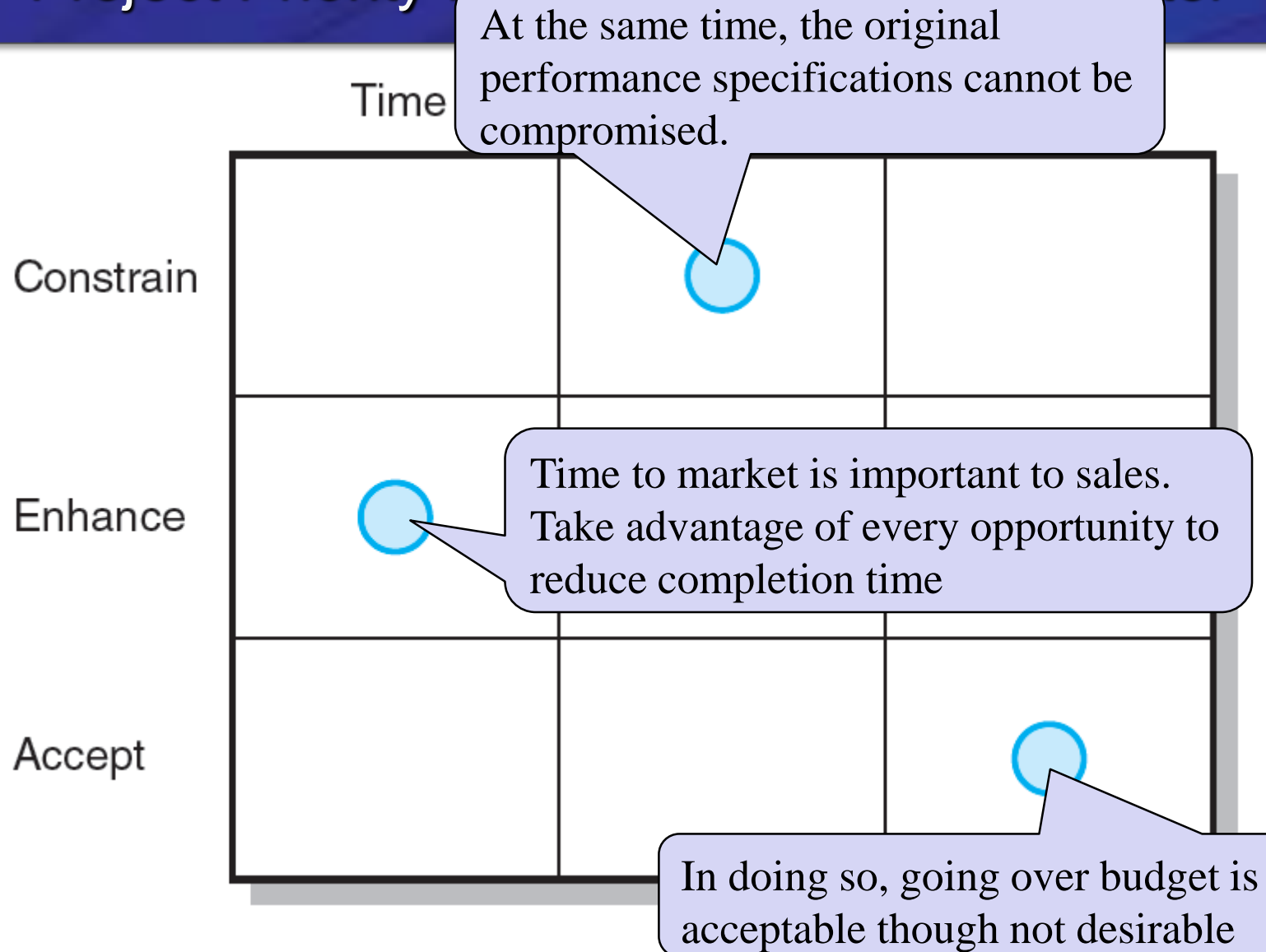


# Step 2: Establishing Project Priorities

- Managing the Priorities of Project Trade-offs
  - **Constrain:** the selected parameter is **Fixed**
    - The project must meet time, performance, or cost
  - **Enhance:** optimizing a criterion **over others**
    - TRY to add value to the selected Parameter (reduce costs, shorten schedule, increase performance)
  - **Accept:** reducing (or not meeting) a criterion requirement
    - The selected parameter is allowed to slip when trade-off have to be made
    - Can reduce scope, performance or allow schedule to slip

	Time	Performance	Cost
Constrain			
Enhance			
Accept			

# Project Priority Matrix: a new wireless router



# Project Priority Matrix: examples

## Project Priority Examples

	Performance		
	Time	(Scope)	Cost
Constrain			*
Enhance		*	
Accept	*		

	Performance		
	Time	(Scope)	Cost
Constrain			
Enhance			
Accept			

We must produce a product to a required specification but we have some flexibility in time project completion date if it reduces the cost of our product. Our product can be a road?

	Performance		
	Time	(Scope)	Cost
Constrain	*		
Enhance		*	
Accept			*

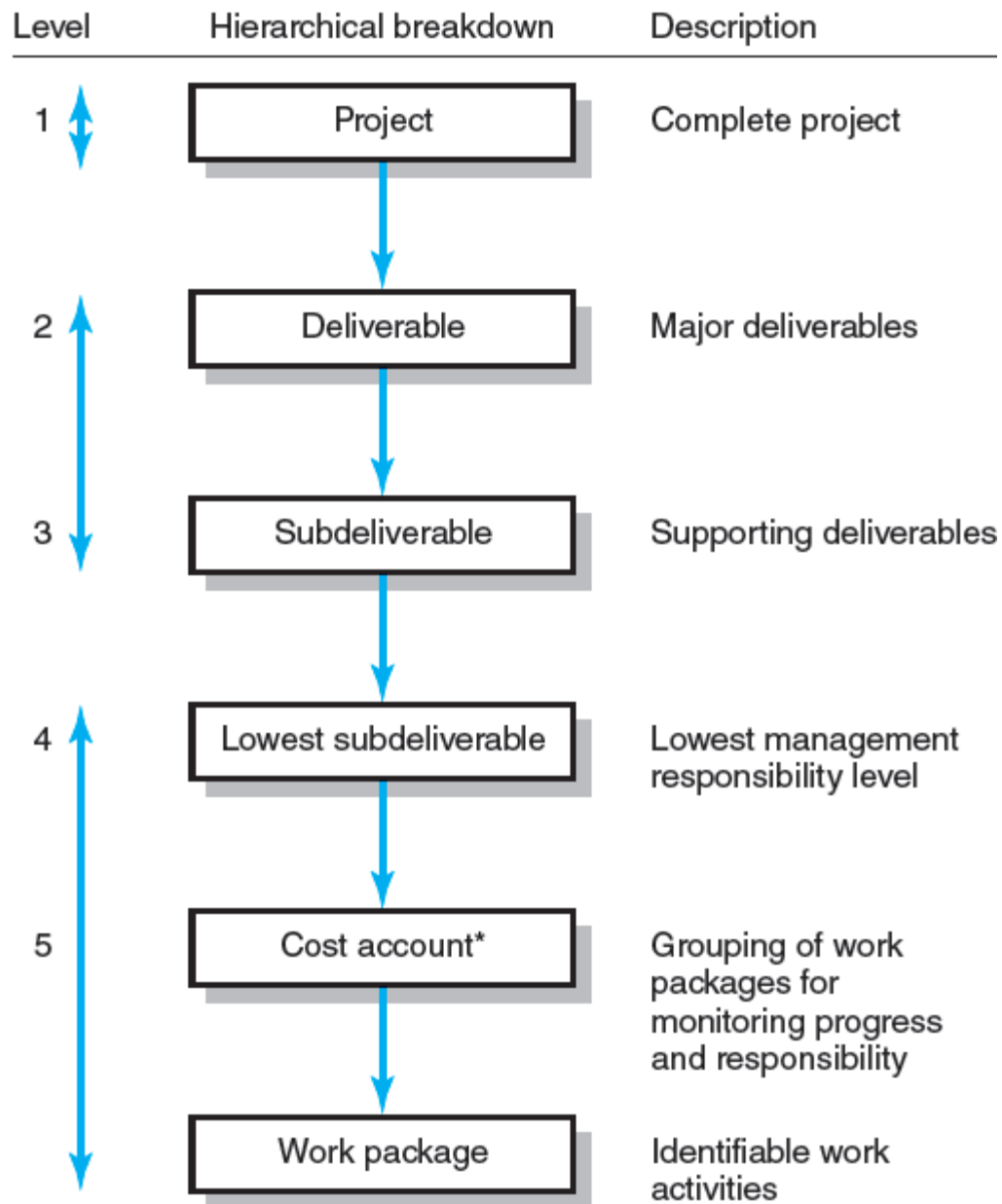
	Performance		
	Time	(Scope)	Cost
Constrain			
Enhance			
Accept			

We have a fixed budget but we are willing to change the scope if it will get the project done in less time.



# Step 3: Creating the Work Breakdown Structure

- Work Breakdown Structure (WBS)
  - A hierarchical outline (map) that identifies the products and work elements involved in a project
    - Should be end item output oriented (focus is on project deliverable rather than on organisational function or processes, such as design, marketing, etc)
  - Defines the relationship of the final deliverable (the project) to its subdeliverables, and in turn, their relationships to **work packages**.
    - Short duration tasks that have defined start/stop points, consume resources and represent cost.
  - Best suited for design and build projects that have tangible outcomes rather than process-oriented projects



## Hierarchical Breakdown of the WBS

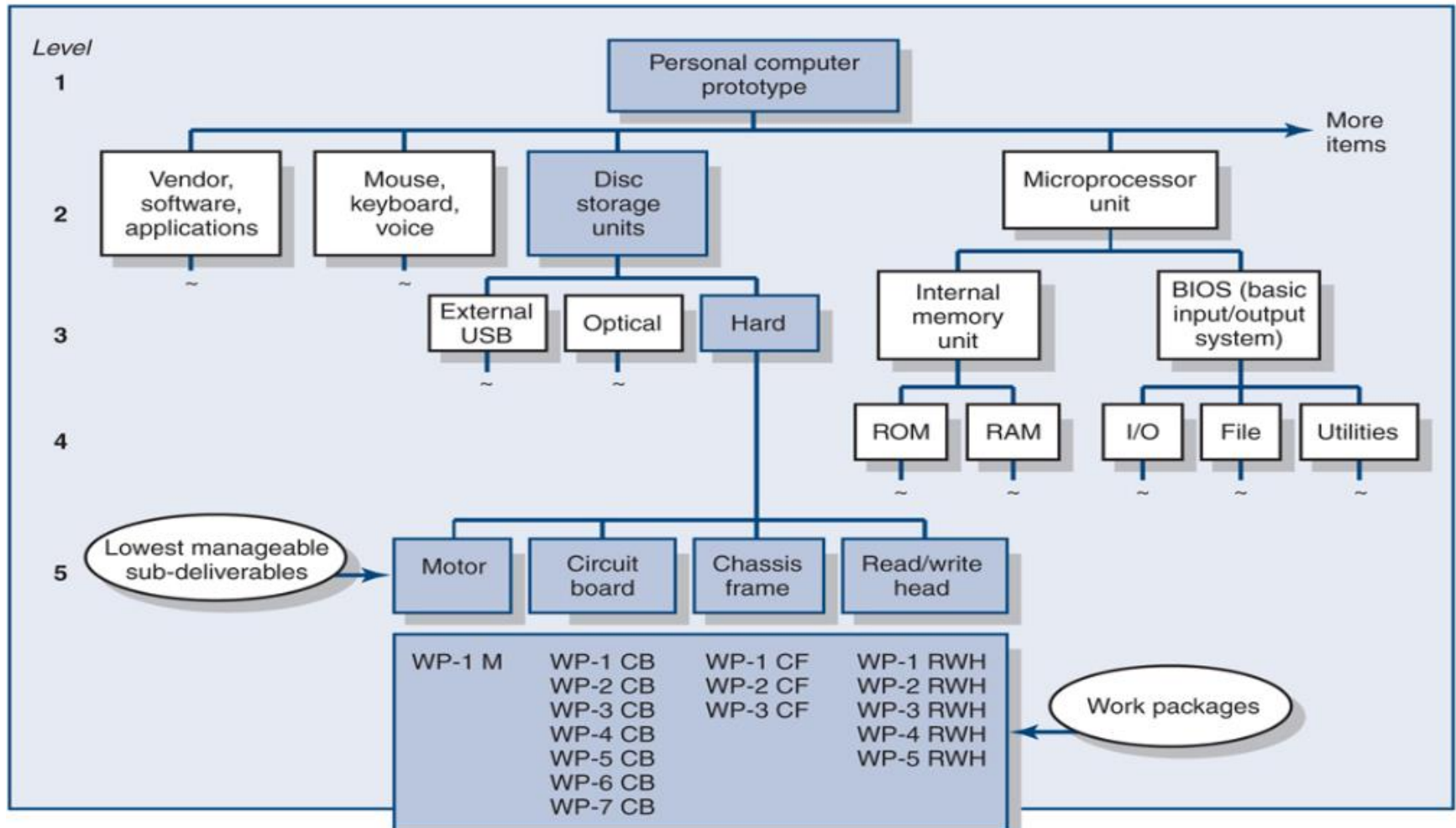
\* This breakdown groups work packages by type of work within a deliverable and allows assignment of responsibility to an organizational unit. This extra step facilitates a system for monitoring project progress (discussed in Chapter 13).

**FIGURE 4.3**

# Work Breakdown Structure : a new prototype tablet computer



Figure 4.4 WORK BREAKDOWN STRUCTURE (WBS)



## Step 3: Creating the Work Breakdown Structure

# 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 for measuring success (how well).

## Step 3: Creating the Work Breakdown Structure

# How WBS Helps the Project Manager

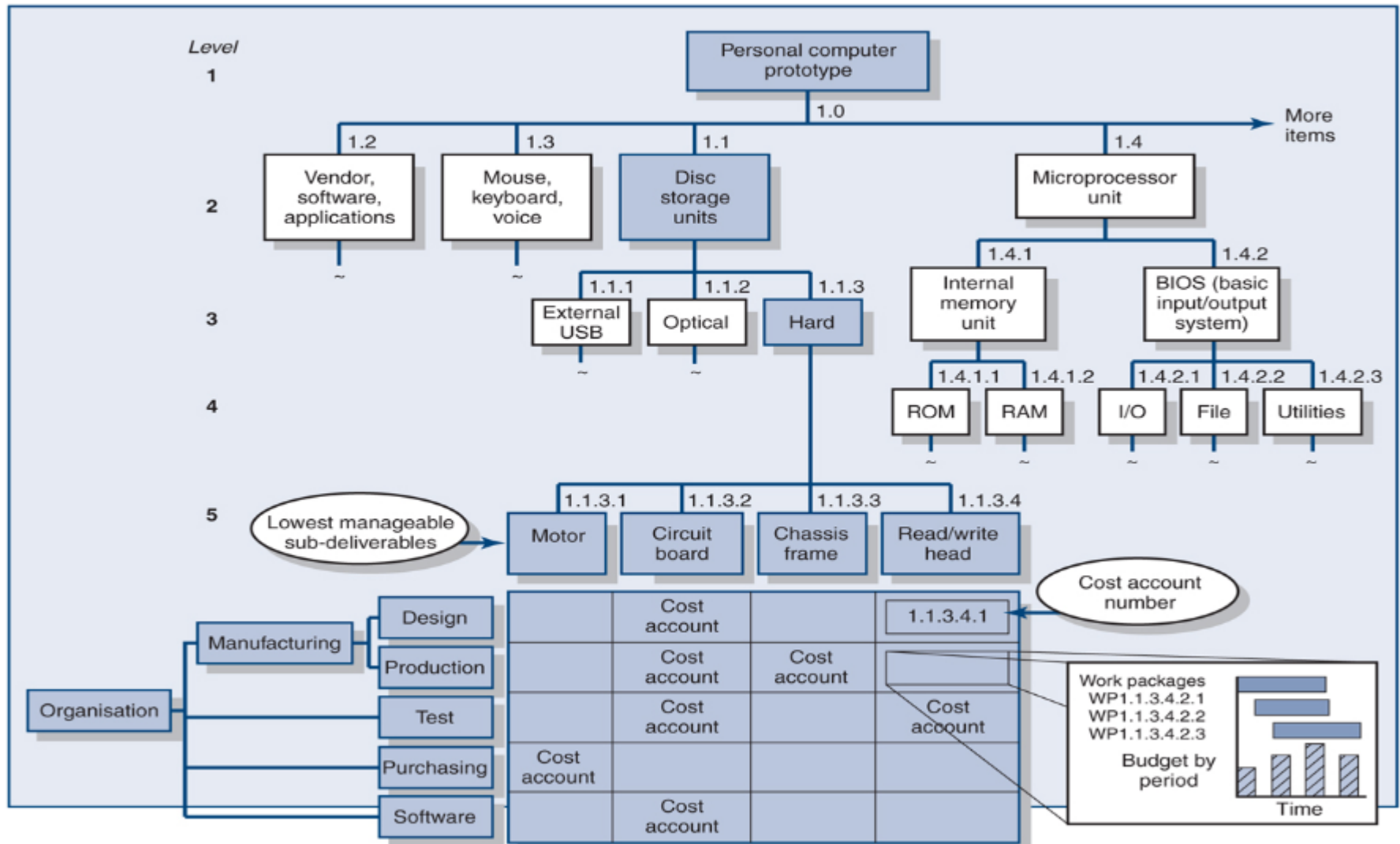
- WBS

- 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.

## 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 unit work performance.
    - Identifies organization units responsible for work packages.
    - Ties organizational units to cost control accounts.

Figure 4.5 INTEGRATION OF WBS AND OBS





# 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
- WBS Dictionary
  - Provides detailed information about each element in the WBS.





# Coding the WBS

	i	Task Mode ▼	Task Name ▼
1			[-] <b>1 E-Slim Tablet x-13 Prototype</b>
2			[-] <b>1.1 Hardware</b>
3			1.1.1 Cameras
4			1.1.2 Speakers
5			1.1.3 Antenna
6			[-] <b>1.2 CPU</b>
7			[-] <b>1.2.1 Power supply</b>
8			1.2.1.1 Battery (more items)
9			1.2.1.2 Charger (more items)
10			[-] <b>1.2.2 Flash Rom (more items)</b>
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			[-] <b>1.2.3 Touch screen</b>
15			[-] <b>1.2.3.1 Keyboard</b>
16			1.2.3.1.1 Work package
17			[-] <b>1.2.3.2 Touch sensors</b>
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)

Limited to 10 subdivisions (0~9),  
So for a large, complex project  
3R-237A-P2-33.6

- 3R: the facility
- 237A: elevation and the area
- P2: pipe two inches wide
- 33.6: work package number

**EXHIBIT 4.1**

WBS is for **product** oriented project.  
For **process-oriented** project ?

# Chapter Outline

1. Work Breakdown structure by 5 generic steps
- 2. Process Breakdown Structure (10 mins break)**
3. Responsibility Matrices
4. Project Communication Plan

# Process Breakdown Structure (PBS) for Software Development Project

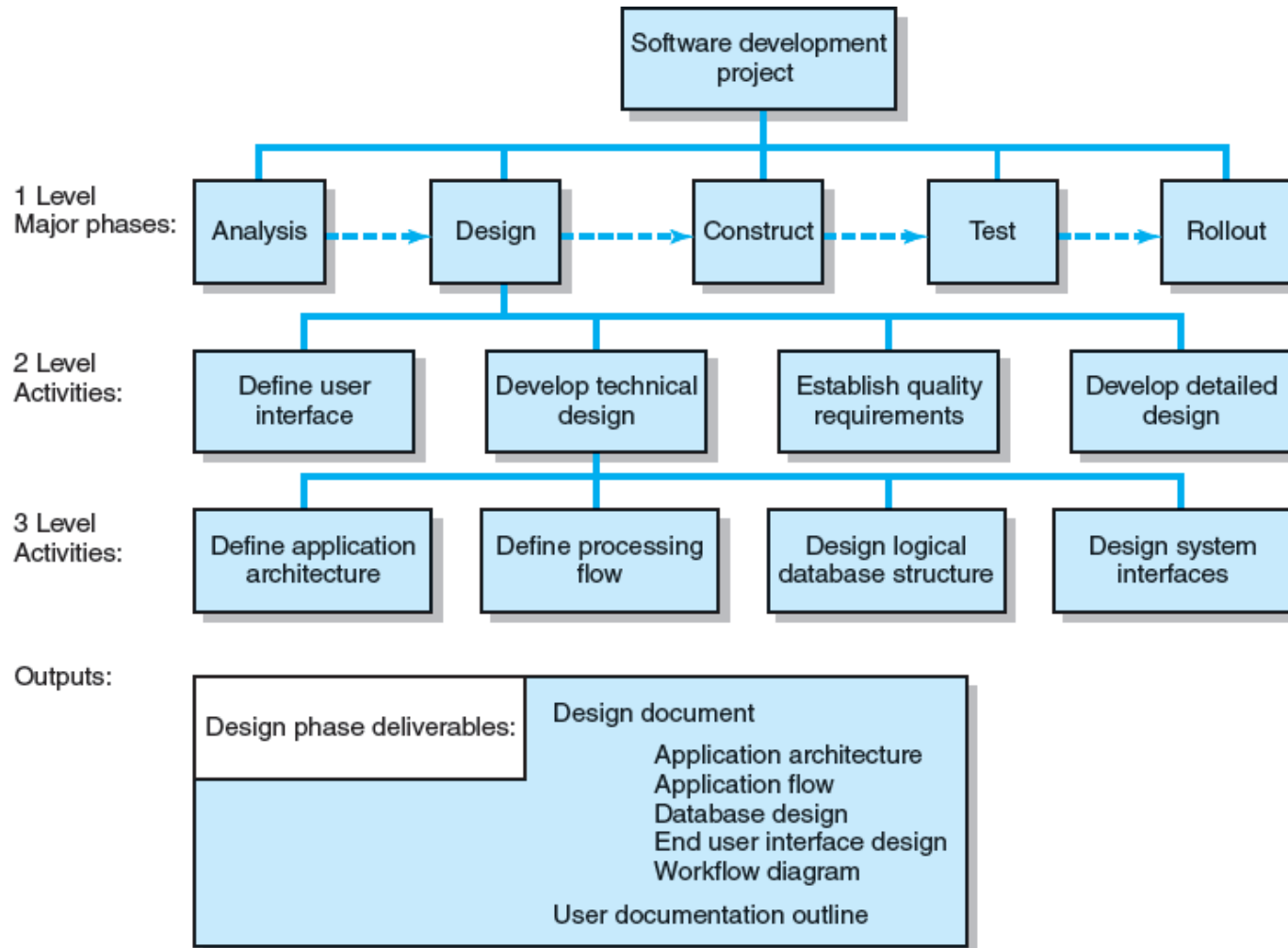


FIGURE 4.6

Will WBS or PBS work  
for a small project ?

# Chapter Outline

1. Work Breakdown structure by 5 generic steps
2. Process Breakdown Structure
- 3. Responsibility Matrices**
4. Project Communication Plan

# 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 responsible for each activity.
    - Clarifies critical interfaces between units and individuals that need coordination.
    - Provide a 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



# 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**

Once the project deliverables and work  
clearly identified,  
what comes next?

# Chapter Outline

1. Work Breakdown structure by 5 generic steps
2. Process Breakdown Structure
3. Responsibility Matrices
4. **Project Communication Plan**

# 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?

# Developing a Communication Plan

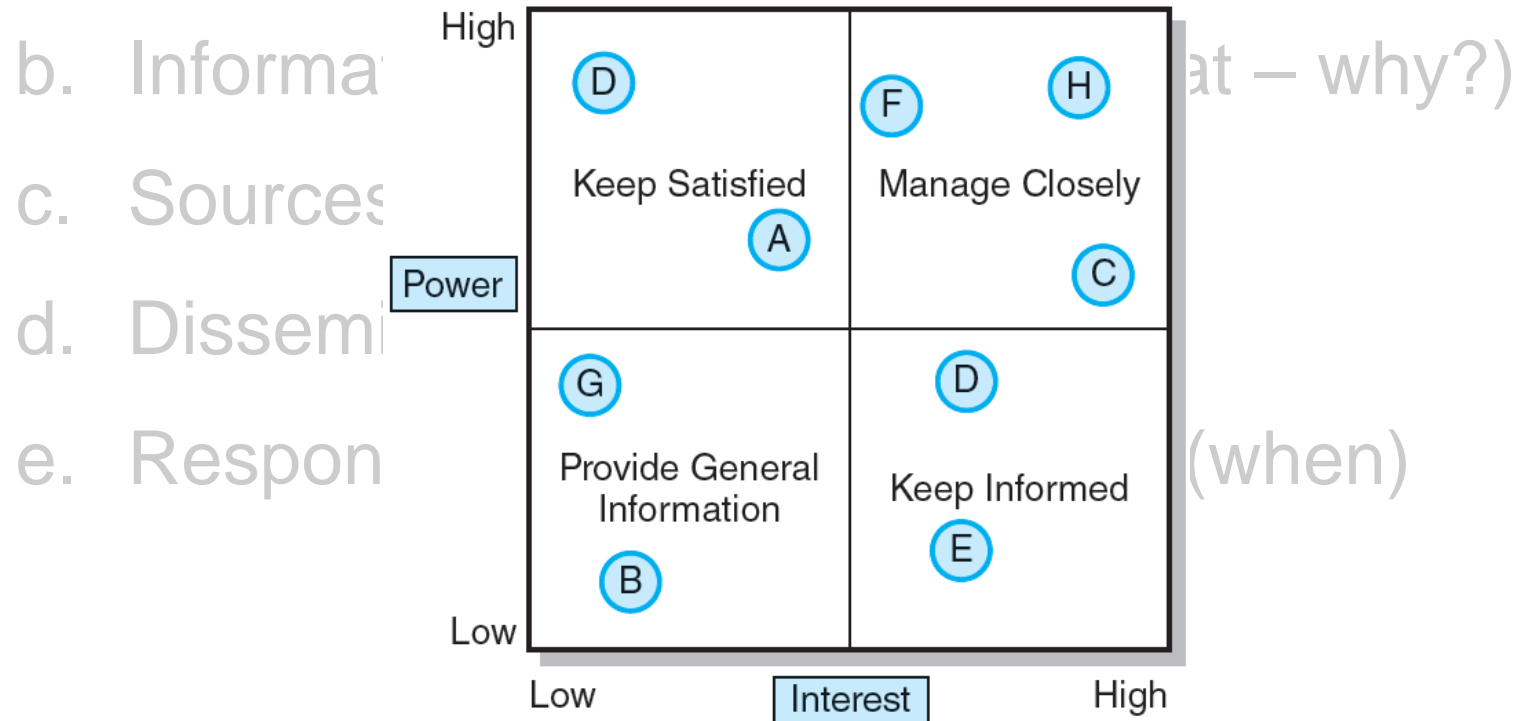
- a. Stakeholder analysis
- b. Information needs (who and what – why?)
- c. Sources of information (where)
- d. Dissemination modes (how)
- e. Responsibility (who) and timing (when)



# Developing a Communication Plan

## a. Stakeholder analysis

Identify Target groups – anyone who has an interest in the project, or contributes to it, who will make decisions



# Developing a Communication Plan

- a. Stakeholder analysis
- b. Information needs (who and what – why?)

What information is required by each group of stakeholders

Project status reports

Deliverable issues

Changes in scope

Team status meetings

Gating decisions

Accepted request changes

Action items

Milestone reports

- c. Sources of information (where)
- d. Dissemination modes (how)
- e. Responsibility (who) and timing (when)



# Developing a Communication Plan

- a. Stakeholder analysis
- b. Information needs (who and what – why?)
- c. Sources of information (where)

Where will information be held? Who will collect it?

- d. Dissemination modes (how)
- e. Responsibility (who) and timing (when)





# Developing a Communication Plan

- a. Stakeholder analysis
- b. Information needs (who and what – why?)
- c. Sources of information (where)
- d. Dissemination modes (how)

E-mail, teleconference, SharePoint, Virtual project office

- e. Responsibility (who) and timing



# Developing a Communication Plan

- a. Stakeholder analysis
- b. Information needs (who and what – why?)
- c. Sources of information (where)
- d. Dissemination modes (how)
- e. Responsibility (who) and timing (when)

Who will send out the information



# Shale Oil Research Project Communication Plan

<i><b>What Information</b></i>	<i><b>Target Audience</b></i>	<i><b>When?</b></i>	<i><b>Method of Communication</b></i>	<i><b>Provider</b></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**

# Key Terms

**Cost account**

**Milestone**

**Organization breakdown structure (OBS)**

**Priority matrix**

**Process breakdown structure (PBS)**

**Project charter**

**Responsibility matrix**

**Scope creep**

**Scope statement**

**WBS dictionary**

**Work breakdown structure (WBS)**

**Work package**

# For next week

- Estimating Project Times and Costs

To Do:

- Read Chapter 5