

# Chapter 5: Project Scope Management

Information Technology Project  
Management, Eighth Edition



Note: See the text itself for full citations.

# Learning Objectives

- ▶ Understand the importance of good project scope management
- ▶ Describe the process of planning scope management
- ▶ Discuss methods for collecting and documenting requirements to meet stakeholder needs and expectations
- ▶ Explain the scope definition process and describe the contents of a project scope statement
- ▶ Discuss the process for creating a work breakdown structure using the analogy, top-down, bottom-up, and mind-mapping approaches

# Learning Objectives

- ▶ Explain the importance of validating scope and how it relates to defining and controlling scope
- ▶ Understand the importance of controlling scope and approaches for preventing scope-related problems on information technology (IT) projects
- ▶ Describe how software can assist in project scope management

# What is Project Scope Management (项目范围管理)?

- ▶ **Scope** refers to *all* the work involved in creating the products of the project and the processes used to create them
- ▶ A **deliverable** is a product produced as part of a project, such as hardware or software, planning documents, or meeting minutes
- ▶ Project scope management includes the processes involved in defining and controlling what is or is not included in a project

# Project Scope Management Processes

- ▶ **Plan scope management:** determining how the project's scope and requirements will be managed
- ▶ **Collect requirements:** defining and documenting the features and functions of the products produced during the project as well as the processes used for creating them
- ▶ **Define scope:** reviewing the project charter, requirements documents, and organizational process assets to create a scope statement
- ▶ **Create the WBS:** subdividing the major project deliverables into smaller, more manageable components
- ▶ **Validate scope:** formalizing acceptance of the project deliverables
- ▶ **Control scope:** controlling changes to project scope throughout the life of the project

# Figure 5-1. Project Scope Management Summary

## Planning

Process: **Plan scope management**

Outputs: Scope management plan, requirements management plan

Process: **Collect requirements**

Outputs: Requirements documentation, requirements traceability matrix

Process: **Define scope**

Outputs: Project scope statement, project documents updates

Process: **Create WBS**

Outputs: Scope baseline, project documents updates

## Monitoring and Controlling

Process: **Validate scope**

Outputs: Accepted deliverables, change requests, work performance information, project documents updates

Process: **Control scope**

Outputs: Work performance information, change requests, project management plan updates, project documents updates, organizational process assets updates

Project Start

Project Finish

# 1. Plan Scope Management (计划范围管理)

- ▶ The project team uses expert judgment and meetings to develop two important outputs: the scope management plan and the requirements management plan
- ▶ The scope management plan is a subsidiary part of the project management plan

# Scope Management Plan Contents (范围管理计划内容)

- ▶ How to prepare a detailed project scope statement
- ▶ How to create a WBS
- ▶ How to maintain and approve the WBS
- ▶ How to obtain formal acceptance of the completed project deliverables
- ▶ How to control requests for changes to the project scope

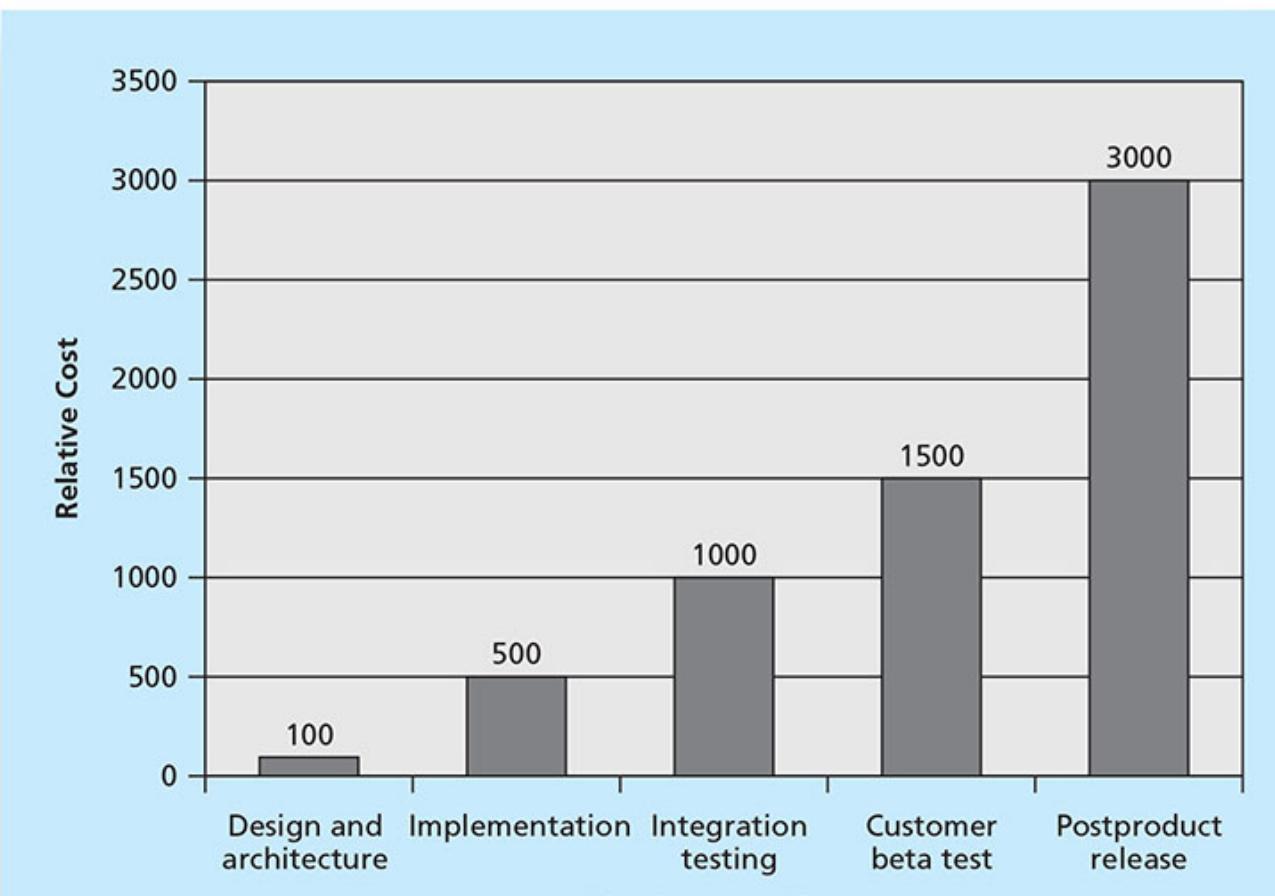
# Requirements Management Plan (需求管理计划)

- ▶ Requirements: conditions or capabilities that must be met by the project or present in the product, service, or result to satisfy an agreement or other formally imposed specification
- ▶ The **requirements management plan** documents how project requirements will be analyzed, documented, and managed

## 2. Collect Requirements (收集需求)

- ▶ For some IT projects, it is helpful to divide requirements development into categories called elicitation, analysis, specification, and validation
- ▶ It is important to use an iterative approach to defining requirements since they are often unclear early in a project

# Figure 5-2. Relative Cost to Correct a Software Requirement Defect



Source: IBM Software Group, "Minimizing code defects to improve software quality and lower development costs," Rational Software (October 2008).

# Methods for Collecting Requirements

- ▶ Interviewing (访谈)
- ▶ Focus groups and facilitated workshops (焦点小组会议和引导式研讨会)
- ▶ Using group creativity and decision-making techniques (群体创新和决策技术)
- ▶ Questionnaires and surveys (问卷调查法)
- ▶ Observation (观察法)
- ▶ Prototyping (原型法)
- ▶ Benchmarking (标杆法)

# Requirements Traceability Matrix (需求跟踪矩阵)

- ▶ A **requirements traceability matrix (RTM)** is a table that lists requirements, various attributes of each requirement, and the status of the requirements to ensure that all are addressed
- ▶ Table 5-1. Sample entry in an RTM

Requirement No.	Name	Category	Source	Status
R32	Laptop memory	Hardware	Project charter and corporate laptop specifications	Complete. Laptops ordered meet requirement by having 4GB of memory.

# 3. Define Scope (定义范围)

- ▶ **Project scope statements** (项目范围说明书) should include at least
  - a product scope description
  - product user acceptance criteria
  - detailed information on all project deliverables.
- ▶ Helpful to have
  - other scope-related information, such as the project boundaries, constraints, and assumptions.
  - supporting documents, such as product specifications
- ▶ As time progresses, the scope of a project should become more clear and specific

# Table 5-2. Sample Project Charter (partial)

<b>Project Title:</b> Information Technology (IT) Upgrade Project	
<b>Project Start Date:</b> March 4	<b>Projected Finish Date:</b> December 4
<b>Key Schedule Milestones:</b>	
<ul style="list-style-type: none"><li>• Inventory update completed April 15</li><li>• Hardware and software acquired August 1</li><li>• Installation completed October 1</li><li>• Testing completed November 15</li></ul>	
<b>Budget Information:</b> Budgeted \$1,000,000 for hardware and software costs and \$500,000 for labor costs.	
<b>Project Manager:</b> Kim Nguyen, (310) 555-2784, knguyen@course.com	
<b>Project Objectives:</b> Upgrade hardware and software for all employees (approximately 2,000) within nine months based on new corporate standards. See attached sheet describing the new standards. Upgrades may affect servers as well as associated network hardware and software.	
<b>Main Project Success Criteria:</b> The hardware, software, and network upgrades must meet all written specifications, be thoroughly tested, and be completed in nine months. Employee work disruptions will be minimal.	
<b>Approach:</b>	
<ul style="list-style-type: none"><li>• Update the IT inventory database to determine upgrade needs</li><li>• Develop detailed cost estimate for project and report to CIO</li><li>• Issue a request for quote to obtain hardware and software</li><li>• Use internal staff as much as possible for planning, analysis, and installation</li></ul>	

# Table 5-3: Further Defining Project Scope

## Project Charter:

Upgrades may affect servers . . . (listed under Project Objectives)

## Project Scope Statement, Version 1:

Servers: If additional servers are required to support this project, they must be compatible with existing servers. If it is more economical to enhance existing servers, a detailed description of enhancements must be submitted to the CIO for approval. See current server specifications provided in Attachment 6. The CEO must approve a detailed plan describing the servers and their location at least two weeks before installation.

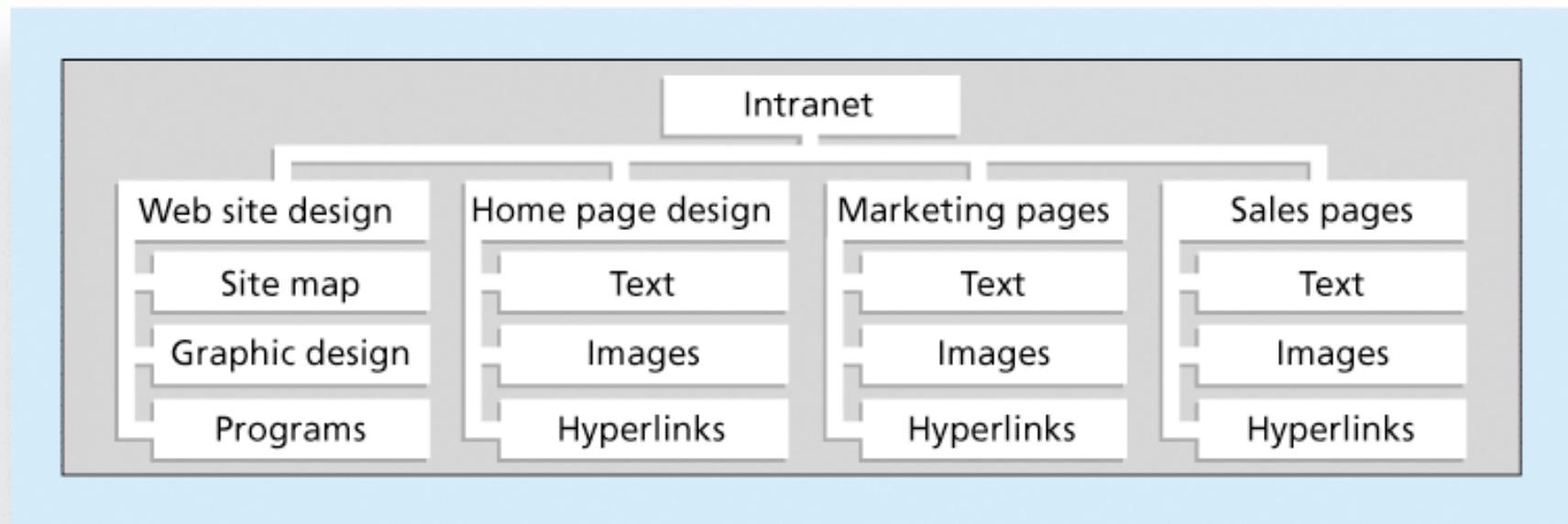
## Project Scope Statement, Version 2:

Servers: This project will require purchasing ten new servers to support Web, network, database, application, and printing functions. Virtualization will be used to maximize efficiency. Detailed descriptions of the servers are provided in a product brochure in Appendix 8 along with a plan describing where they will be located.

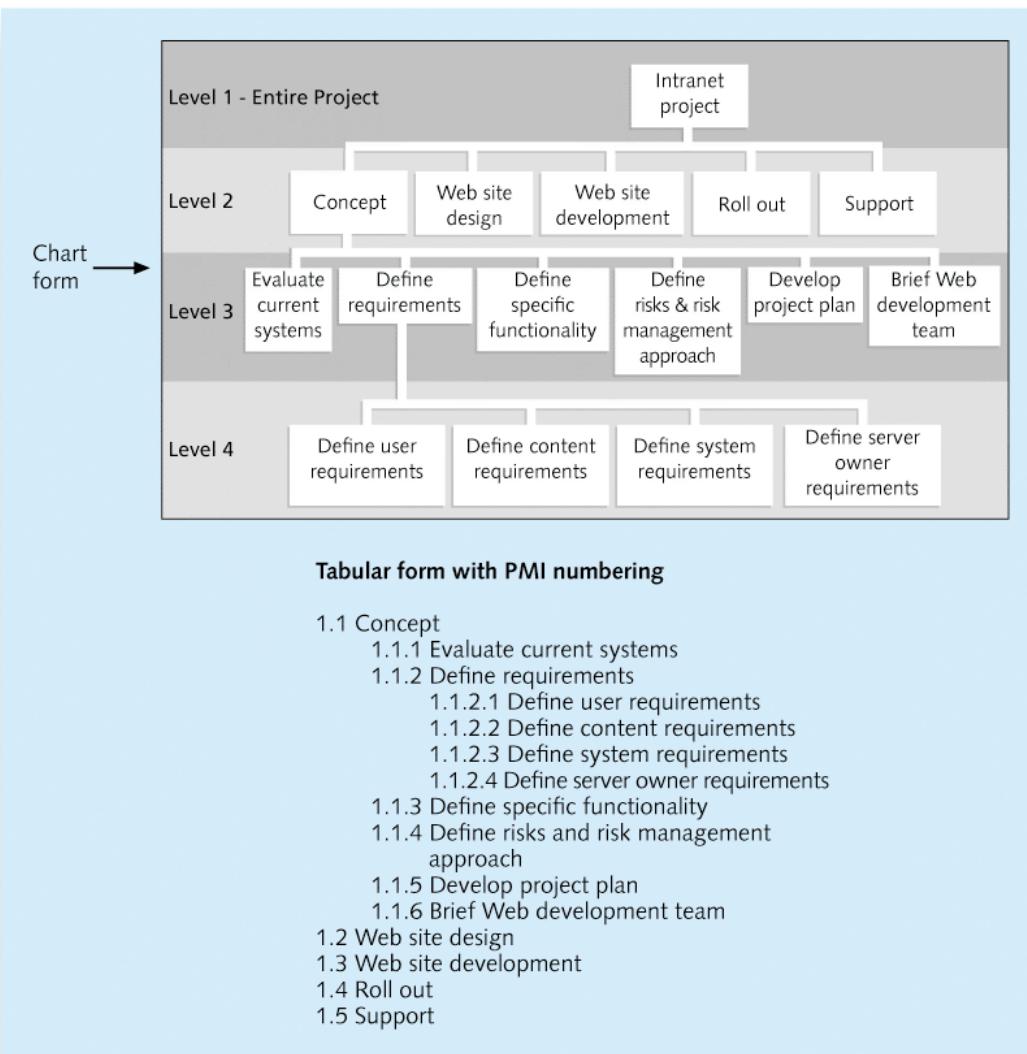
# 4. Create the Work Breakdown Structure (WBS)(创建工作分解结构)

- ▶ A **WBS** is a deliverable-oriented grouping of the work involved in a project that defines the total scope of the project
- ▶ WBS is a foundation document that provides the basis for planning and managing project schedules, costs, resources, and changes
- ▶ **Decomposition (分解)** is subdividing project deliverables into smaller pieces
- ▶ A **work package (工作包)** is a task at the lowest level of the WBS

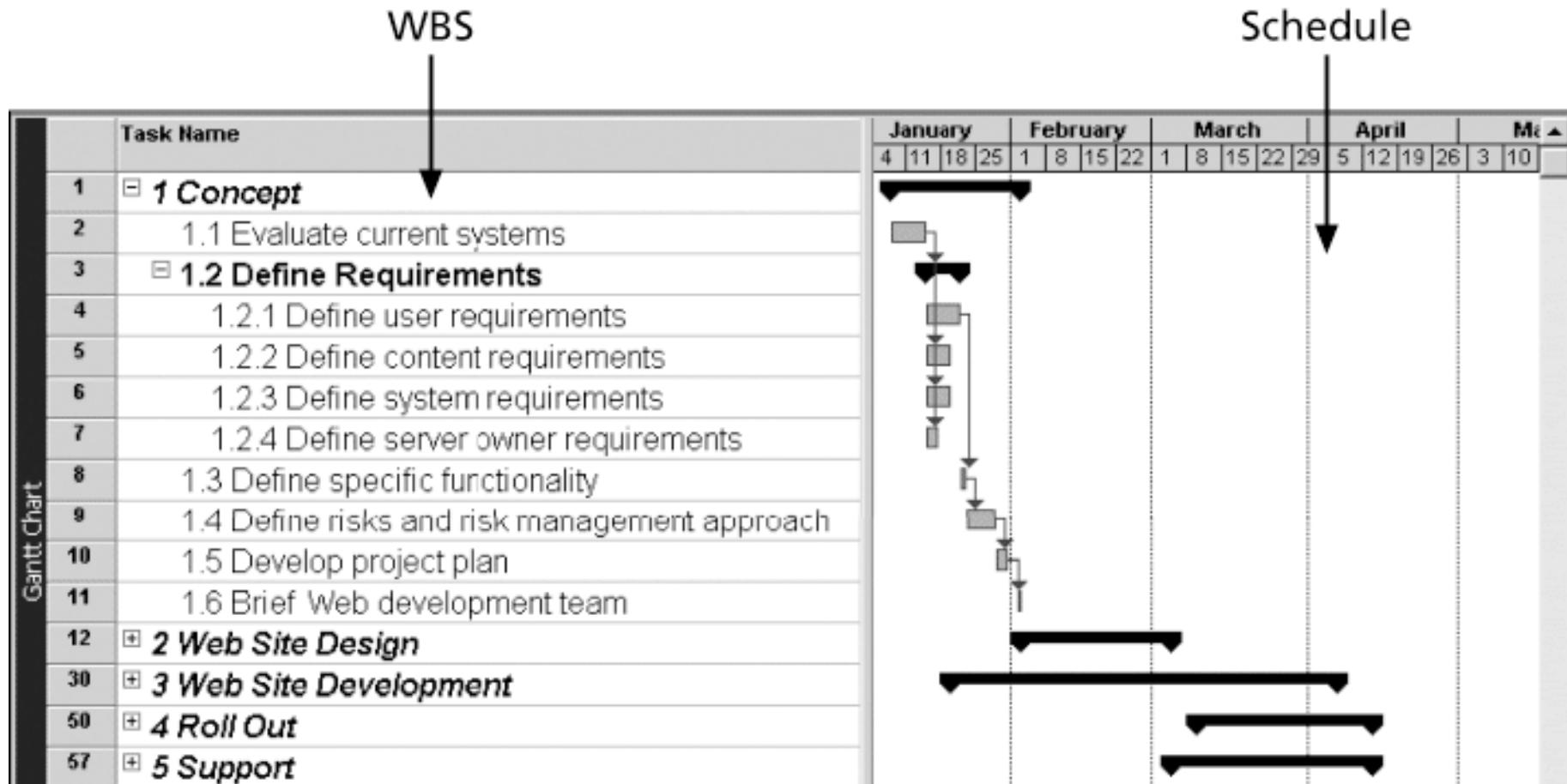
# Figure 5-3. Sample Intranet WBS Organized by Product



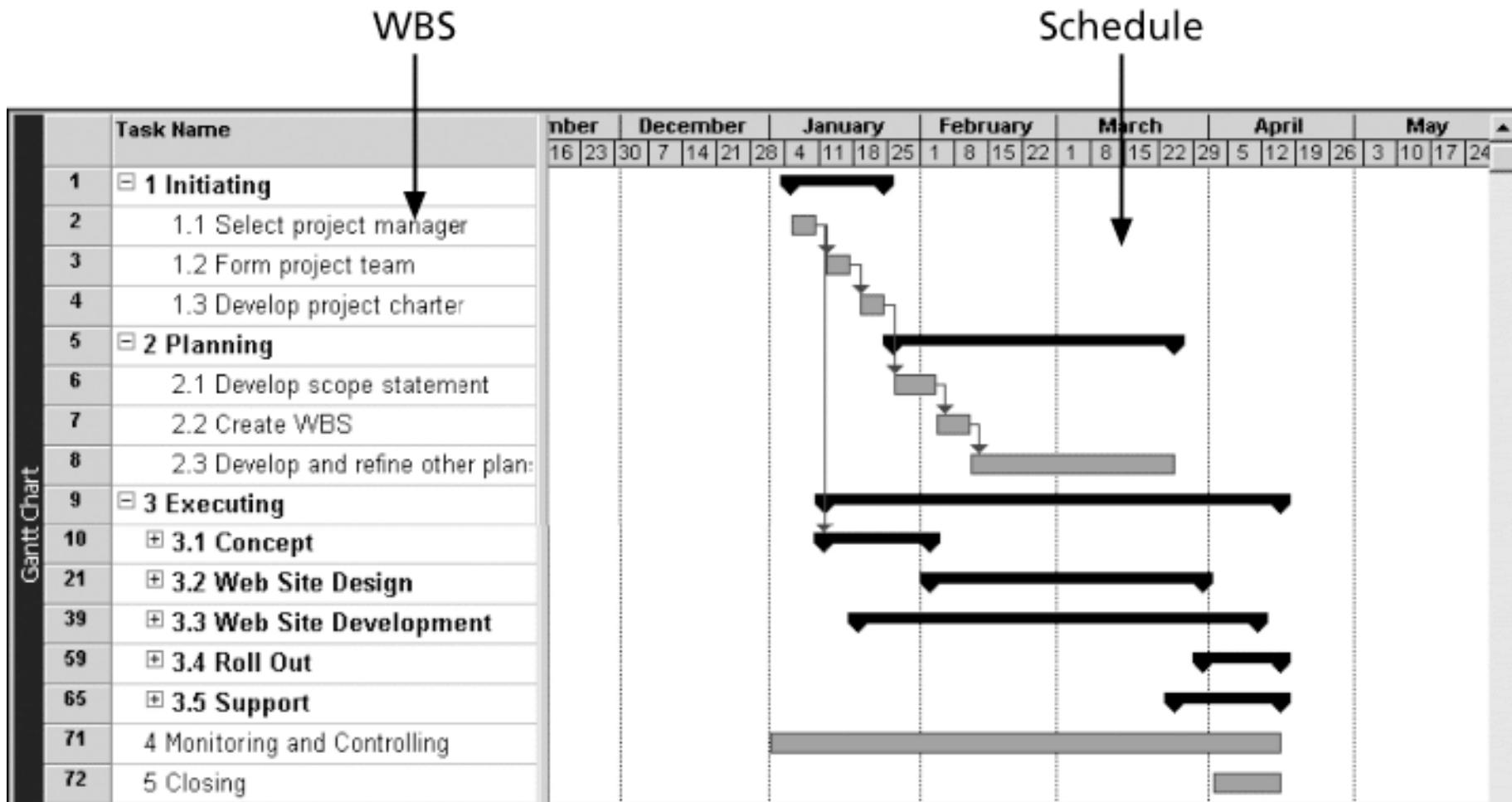
# Figure 5-4. Sample Intranet WBS Organized by Phase



# Figure 5-5. Intranet WBS and Gantt Chart in Microsoft Project



# Figure 5-6. Intranet Gantt Chart Organized by Project Management Process Groups



# Table 5-4: Executing Tasks for JWD Consulting's WBS

## 3.0 Executing

3.1 Survey

3.2 User inputs

3.3 Intranet site content

    3.3.1 Templates and Tools

    3.3.2 Articles

    3.3.3 Links

    3.3.4 Ask the Expert

    3.3.5 User requests feature

3.4 Intranet site design

3.5 Intranet site construction

3.6 Site testing

3.7 Site promotion

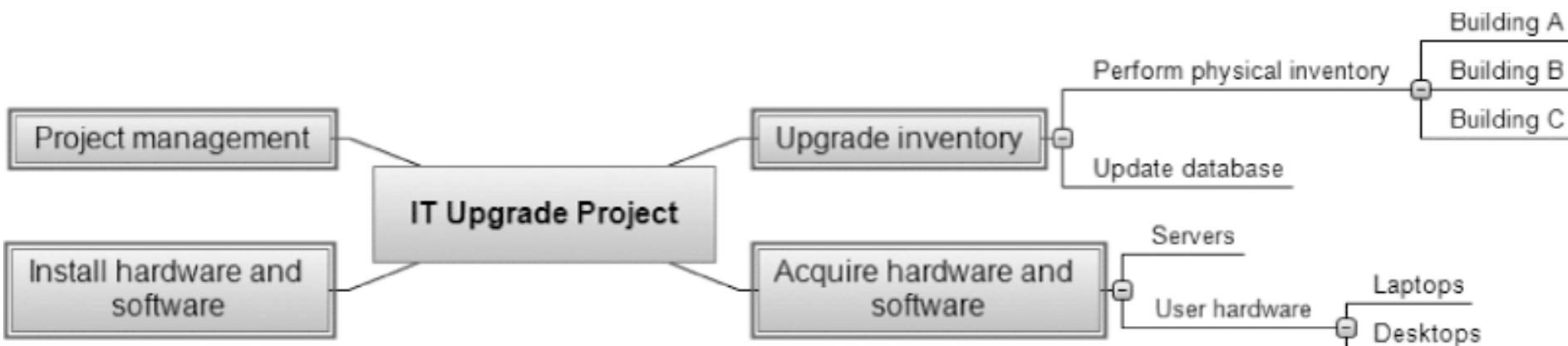
3.8 Site roll out

3.9 Project benefits measurement

# Approaches to Developing WBSs

- ▶ **Using guidelines(使用指南)**: Some organizations, like the DOD (the U.S. Department of Defense), provide guidelines for preparing WBSs
- ▶ **The analogy approach(类比法)**: Review WBSs of similar projects and tailor to your project
- ▶ **The top-down approach(自上而下法)**: Start with the largest items of the project and break them down
- ▶ **The bottom-up approach(自下而上法)**: Start with the specific tasks and roll them up
- ▶ **Mind-mapping approach(心智图法)**: Mind mapping is a technique that uses branches radiating out from a core idea to structure thoughts and ideas

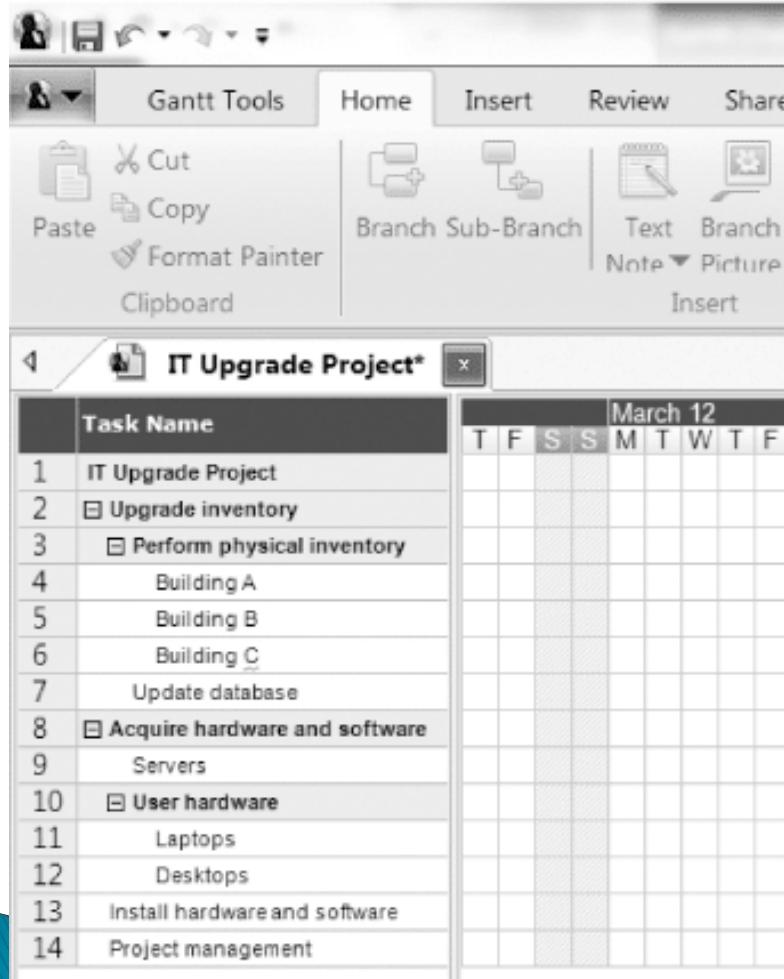
# Figure 5-7. Sample Mind-Mapping Approach for Creating a WBS



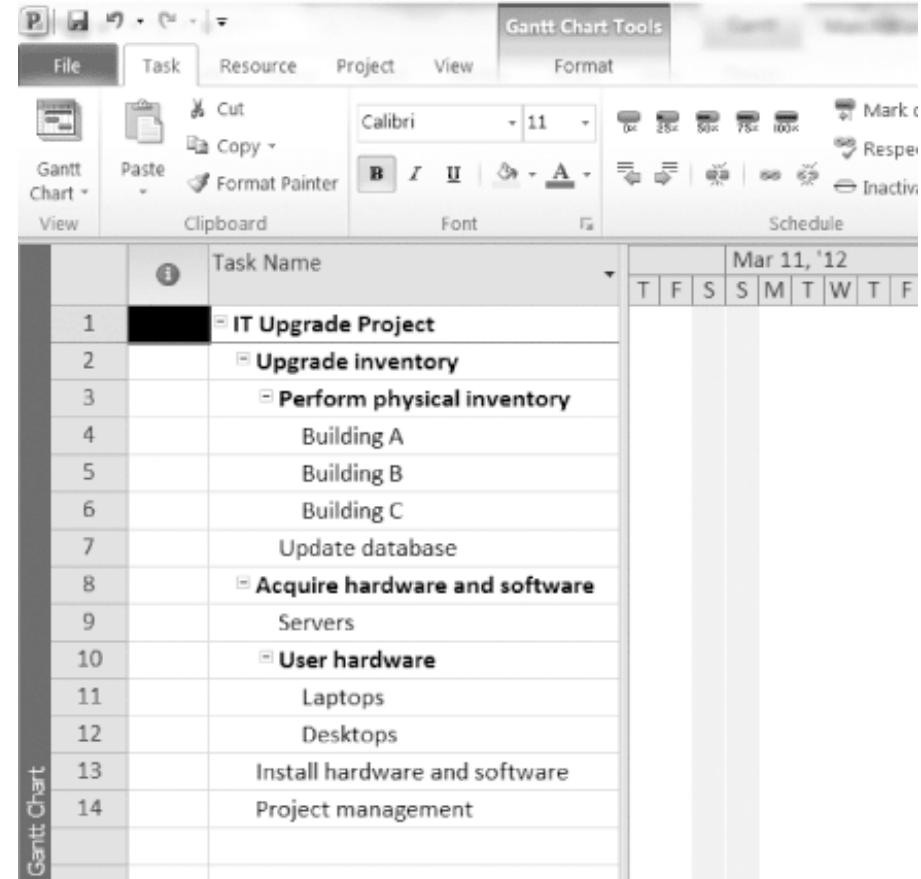
Source: MatchWare's MindView 4 Business Edition

# Figure 5-8. Gantt Charts With WBS Generated From a Mind Map

MindView 4.0 Gantt Chart



Project 2010 Gantt Chart



# The WBS Dictionary and Scope Baseline (WBS词典及范围基线)

- ▶ Many WBS tasks are vague and must be explained more so people know what to do and can estimate how long it will take and what it will cost to do the work
- ▶ A **WBS dictionary (WBS词典)** is a document that describes detailed information about each WBS item
- ▶ The **scope baseline (范围基线)** includes the approved project scope statement and its associated WBS and WBS dictionary

# Table 5-5. Sample WBS Dictionary Entry

## WBS Dictionary Entry March 20

**Project Title:** Information Technology (IT) Upgrade Project

**WBS Item Number:** 2.2

**WBS Item Name:** Update Database

**Description:** The IT department maintains an online database of hardware and software on the corporate intranet. However, we need to make sure that we know exactly what hardware and software employees are currently using and if they have any unique needs before we decide what to order for the upgrade. This task will involve reviewing information from the current database, producing reports that list each department's employees and location, and updating the data after performing the physical inventory and receiving inputs from department managers. Our project sponsor will send a notice to all department managers to communicate the importance of this project and this particular task. In addition to general hardware and software upgrades, the project sponsors will ask the department managers to provide information for any unique requirements they might have that could affect the upgrades. This task also includes updating the inventory data for network hardware and software. After updating the inventory database, we will send an e-mail to each department manager to verify the information and make changes online as needed. Department managers will be responsible for ensuring that their people are available and cooperative during the physical inventory. Completing this task is dependent on WBS Item Number 2.1, Perform Physical Inventory, and must precede WBS Item Number 3.0, Acquire Hardware and Software.

# 5. Validate Scope (核实范围)

- ▶ It is very difficult to create a good scope statement and WBS for a project
- ▶ It is even more difficult to verify project scope and minimize scope changes
- ▶ **Scope validation** involves formal acceptance of the completed project deliverables
- ▶ Acceptance is often achieved by a customer inspection and then sign-off on key deliverables

# 6. Control Scope (控制范围)

- ▶ Scope control involves controlling changes to the project scope
- ▶ Goals of scope control are to
  - influence the factors that cause scope changes
  - assure changes are processed according to procedures developed as part of integrated change control, and
  - manage changes when they occur
- ▶ **Variance (偏差)** is the difference between planned and actual performance

# Using Software to Assist in Project Scope Management

- ▶ Word-processing software helps create several scope-related documents
- ▶ Spreadsheets help to perform financial calculations, weighed scoring models, and develop charts and graphs
- ▶ Communication software like e-mail and the Web help clarify and communicate scope information
- ▶ Project management software helps in creating a WBS, the basis for tasks on a Gantt chart

# Chapter Summary

- ▶ Project scope management includes the processes required to ensure that the project addresses all the work required, and only the work required, to complete the project successfully
- ▶ Main processes include
  - Define scope management
  - Collect requirements
  - Define scope
  - Create WBS
  - Validate scope
  - Control scope