IT PROJECT MANAGEMENT

WEEK 5 : PROJECT SCOPE MANAGEMENT

KATHY SCHWALBE

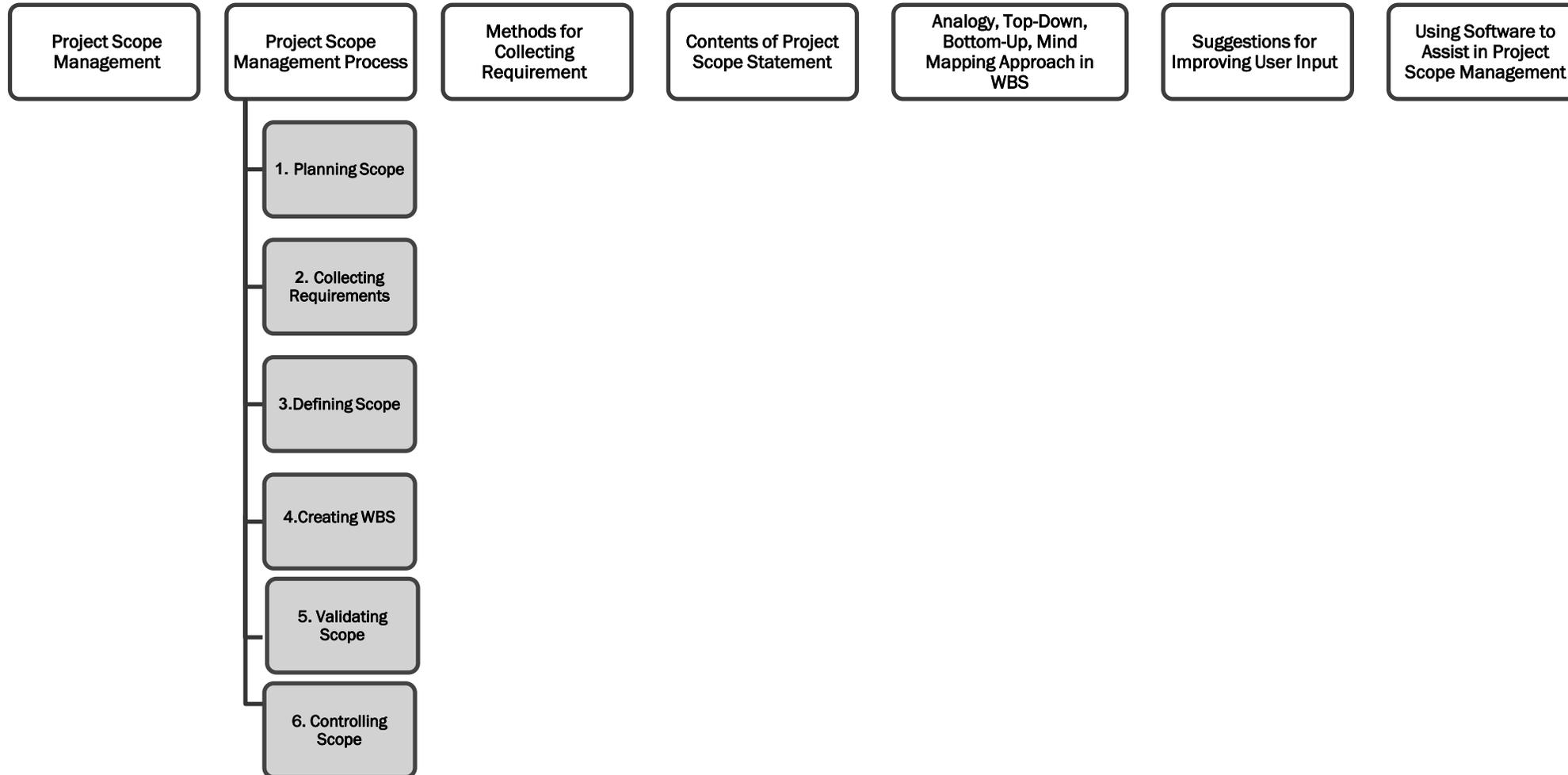INFORMATION TECHNOLOGY PROJECT MANAGEMENT 8e

Note:
Adapted from slide of the textbook: Schwalbe, Kathy. Managing Information Technology Project – Eight Edition. Boston, MA: Thomson Course Technology, 2016.
See the text itself for full citations.

MIND MAP

| Project Scope Management | Project Scope Management Process | Methods for Collecting Requirement | Contents of Project Scope Statement | Analogy, Top-Down, Bottom-Up, Mind Mapping Approach in WBS | Suggestions for Improving User Input | Using Software to Assist in Project Scope Management |

Project Scope Management Process:
- 1. Planning Scope
- 2. Collecting Requirements
- 3. Defining Scope
- 4. Creating WBS
- 5. Validating Scope
- 6. Controlling Scope

LEARNING OBJECTIVES

PART 1 - > Available in Video Material

a) Understand the **importance** of good project scope management

b) Describe the process of **planning scope** management

c) Discuss methods for **collecting** and **documenting requirements** to meet stakeholder needs and expectations

d) Explain the **scope definition process** and describe the contents of a project scope statement

e) Discuss the process for **creating** a **work breakdown structure** using the analogy, top-down, bottom-up, and mind-mapping approaches

PART 2

a) Explain the importance of **validating scope** and how it relates to defining and controlling scope

b) Understand the importance of **controlling scope** and approaches for preventing scope-related problems on information technology (IT) projects

c) Describe considerations for agile/adaptive environments

PART 1.A: WHAT IS PROJECT SCOPE MANAGEMENT
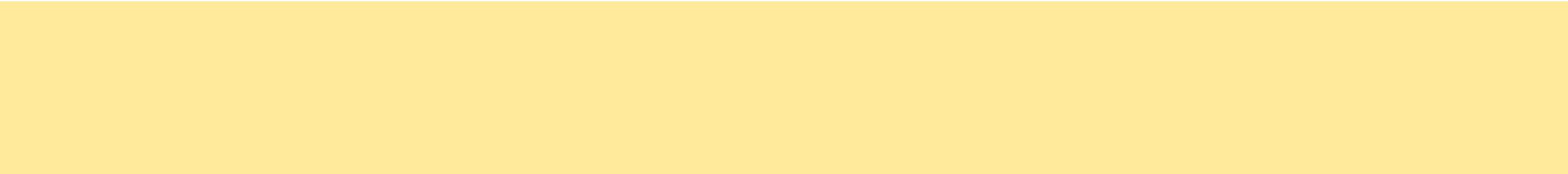
WHAT IS PROJECT SCOPE MANAGEMENT?

- **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.

- It ensures that the project team and stakeholders have the same understanding of what products the project will produce and what processes the project team will use to produce them

PROJECT SCOPE MANAGEMENT PROCESSES

- **Planning scope:** determining how the project's scope and requirements will be managed.

- **Collecting requirements:** defining and documenting the features and functions of the products produced during the project as well as the processes used for creating them.

- **Defining scope:** reviewing the project charter, requirements documents, and organizational process assets to create a scope statement.

- **Creating the WBS:** subdividing the major project deliverables into smaller, more manageable components.

- **Validating scope:** formalizing acceptance of the project deliverables.

- **Controlling scope:** controlling changes to project scope throughout the life of the project.

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**

# PART 1.B: PLANNING SCOPE MANAGEMENT

PLANNING SCOPE MANAGEMENT

- 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

- A scope management plan includes the following information

    - 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

- The PMBOK® Guide, Fifth Edition, describes *requirements* as

    - "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. A requirements management plan can include the following information :

    - How to plan, track, and report requirements activities

    - How to perform configuration management activities

    - How to prioritize requirements

    - How to use product metrics

   - How to trace and capture attributes of requirements

PART 1.C: COLLECTING REQUIREMENT
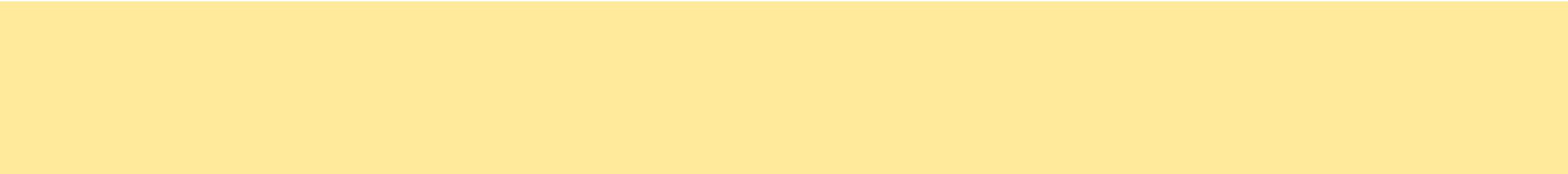
COLLECTING REQUIREMENTS

- The second step in project scope management is often the most difficult: collecting requirements.

- A major consequence of not defining requirements well is rework, which can consume up to half of project costs, especially for software development projects

- 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

Relative Cost to Correct a Software Requirement Defect
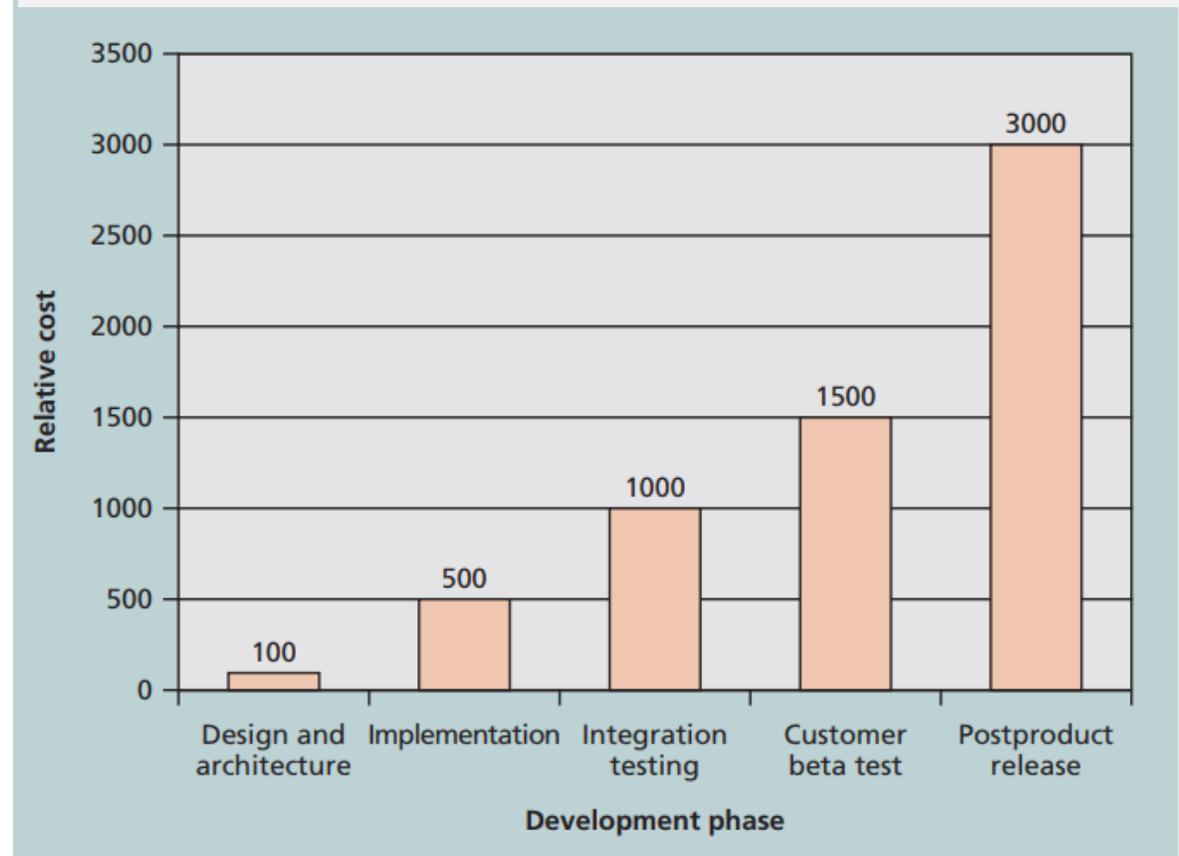
Source: IBM Software Group, "Minimizing code defects to improve software qua[lity] [l]ower development costs," Rational Software (October 2008).

METHODS FOR COLLECTING REQUIREMENTS

- Interviewing

- Focus groups and facilitated workshops

- Using group creativity and decision-making techniques

- Questionnaires and surveys

- Observation

- Prototyping

- **Benchmarking**, or generating ideas by comparing specific project practices or product characteristics to those of other projects or products inside or outside the performing organization, can also be used to collect requirements

STATISTICS ON REQUIREMENTS FOR SOFTWARE PROJECTS

Even though there are many ways to collect requirements, people who work on software projects in particular have considerable **difficulty** defining and managing requirements

- Eighty-eight percent of the software projects involved **enhancing** existing products instead of creating new ones

- Eighty-six percent of respondents said that customer satisfaction was the most important metric for measuring the success of development projects.

- Seventy-five percent of respondents were managing projects with at least 100 requirements; 20 percent were managing projects with over 1,000 requirements.

- Seventy percent of respondents spent at least 10 percent of their time **managing changes to requirements**; 30 percent spent more than 25 percent of their time on such changes.

- Eighty-three percent of software development teams still use Microsoft Office applications such as Word and Excel as their main tools to communicate requirements.

*John Simpson, "2011: The State of Requirements Management" (2011).

REQUIREMENTS TRACEABILITY MATRIX

- Requirements are often broken down into **different categories** such as functional requirements, service requirements, performance requirements, quality requirements, and training requirements.

- 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 requirements are addressed

- 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 memory requirement.

PART 1.D: DEFINING SCOPE
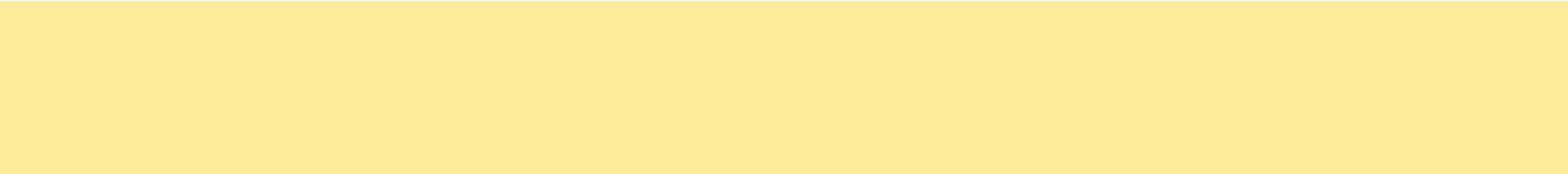
DEFINING SCOPE

- Good scope definition is very **important** to project success because it helps improve the **accuracy** of time, cost, and resource estimates, it defines a **baseline** for performance measurement and project control, and it aids in **communicating clear work responsibilities**.

- **Project scope statements** should include at least a :
    - product scope description,
    - product user acceptance criteria, and
    - detailed information on all project deliverables.

- It is also helpful to document other scope-related information, such as the project boundaries, constraints, and assumptions. The project scope statement should also reference supporting documents, such as product specifications

- As time progresses, the scope of a project should become clearer and more specific

TABLE 5-2. SAMPLE PROJECT CHARTER (PARTIAL)

Project Title: Information Technology (IT) Upgrade project
Project Start Date: March 4 **Project Finish Date:** December 4
Key Schedule Milestones: • Inventory update completed April 15 • Hardware and software acquired August 1 • Installation complete October 1 • Testing complete November 15
Budget information: Budgeted $1,000,000 for hardware and software costs and $500,000 for labor costs.
Manager: Kim Nguyen, (310) 555- 2784, knguyen@course.com
Project objectives: 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.
Main Project Success Criteria: 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.
Approach: • Update the IT inventory database to determine upgrade needs. • Develop detailed cost estimate for project and report to CIO • Issue a request for quote to obtain hardware and software • Use internal staff as much as possible for planning, analysis, and installation

TABLE 5-3: FURTHER DEFINING PROJECT SCOPE

Project Charter: Upgrades may affect servers...(listed under Project Objective)
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 2 weeks before installation.
Project Scope Statement, Version 2 Servers: This project will required purchasing ten new servers to support Web, network, database, applications and printing functions. Virtualization will be used to maximize efficient. Detailed descriptions of the servers are provided in a product brochure in Appendix 8 along with a plan describing where they will be located.

MEDIA SNAPSHOT

➢ Inaccurate requirements gathering continues to be one of the main causes of project failure

➢ For every dollar spent on projects and programs, 5.1 percent is wasted due to poor requirements management

➢ Organizations need to develop people, processes, and culture to improve requirements management
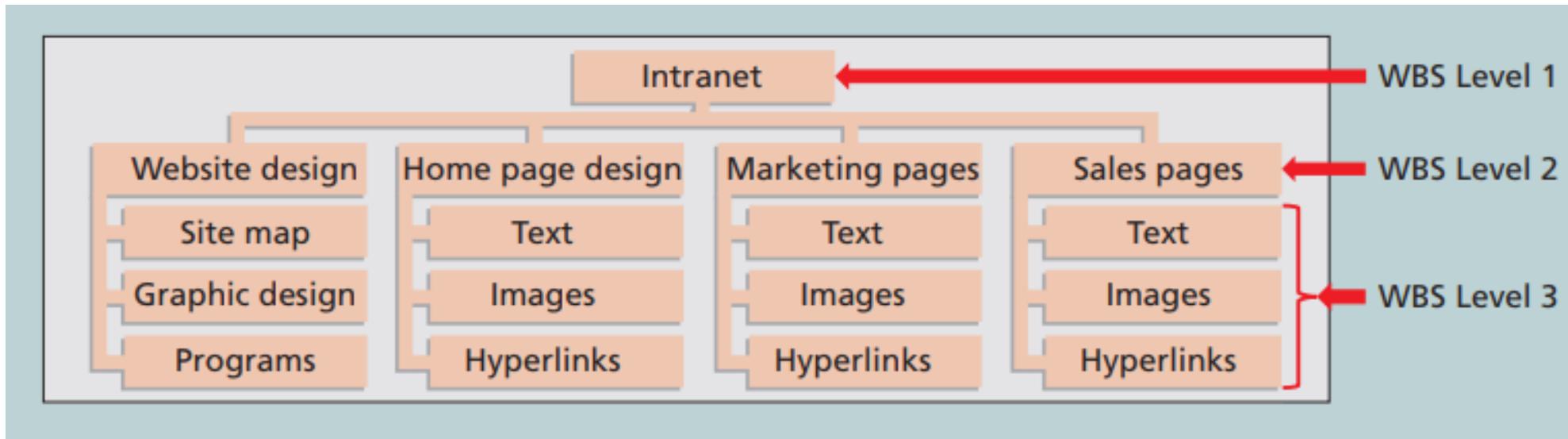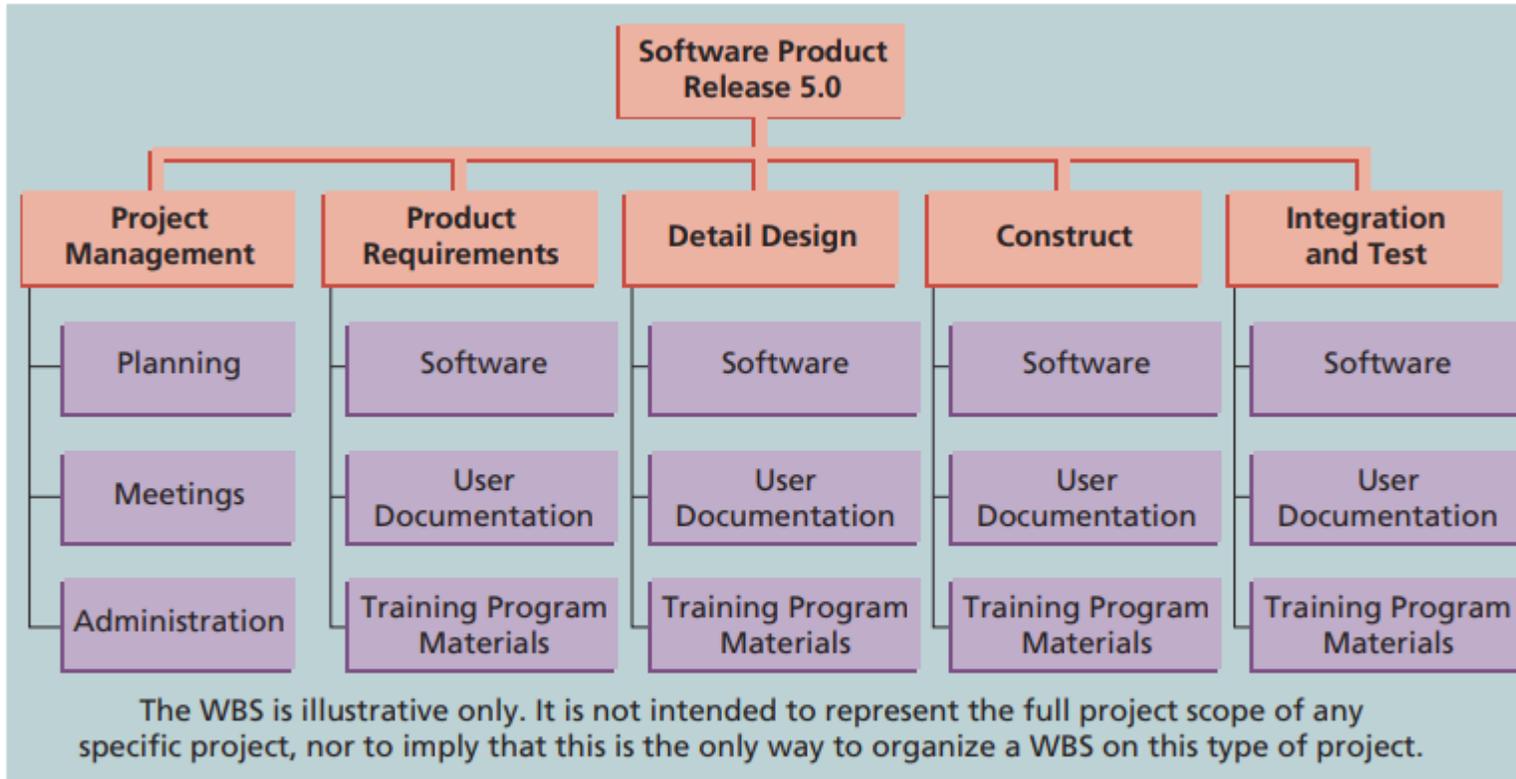
PART 1.E: CREATING THE WORK BREAKDOWN STRUCTURE

CREATING THE WORK BREAKDOWN STRUCTURE (WBS)

- 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** is subdividing project deliverables into smaller pieces

- A **work package** is a task at the lowest level of the WBS

- The **scope baseline** includes the approved **project scope statement** and its associated **WBS** and **WBS dictionary**

SAMPLE INTRANET WBS ORGANIZED BY PRODUCT

# SAMPLE INTRANET WBS ORGANIZED BY PHASE AND TABULAR FORM

The WBS is illustrative only. It is not intended to represent the full project scope of any specific project, nor to imply that this is the only way to organize a WBS on this type of project.

Source: *PMBOK® Guide – Sixth Edition*. Project Management Institute, Inc. (2017). Copyright and all rights reserved. Material from this publication has been reproduced with permission of PMI.

INTRANET WBS AND GANTT CHART IN MICROSOFT PROJECT
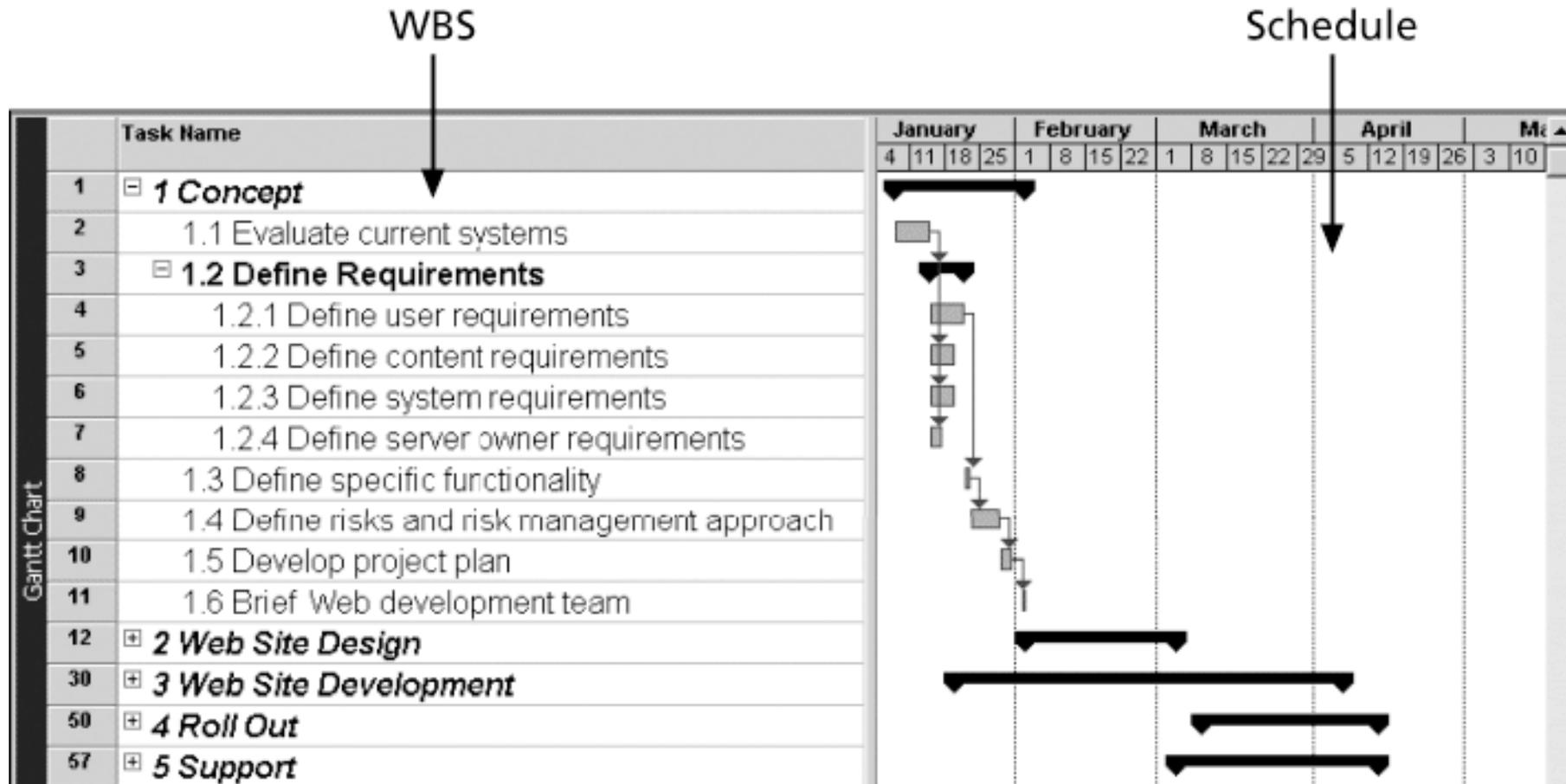
# INTRANET GANTT CHART ORGANIZED BY PROJECT MANAGEMENT PROCESS GROUPS
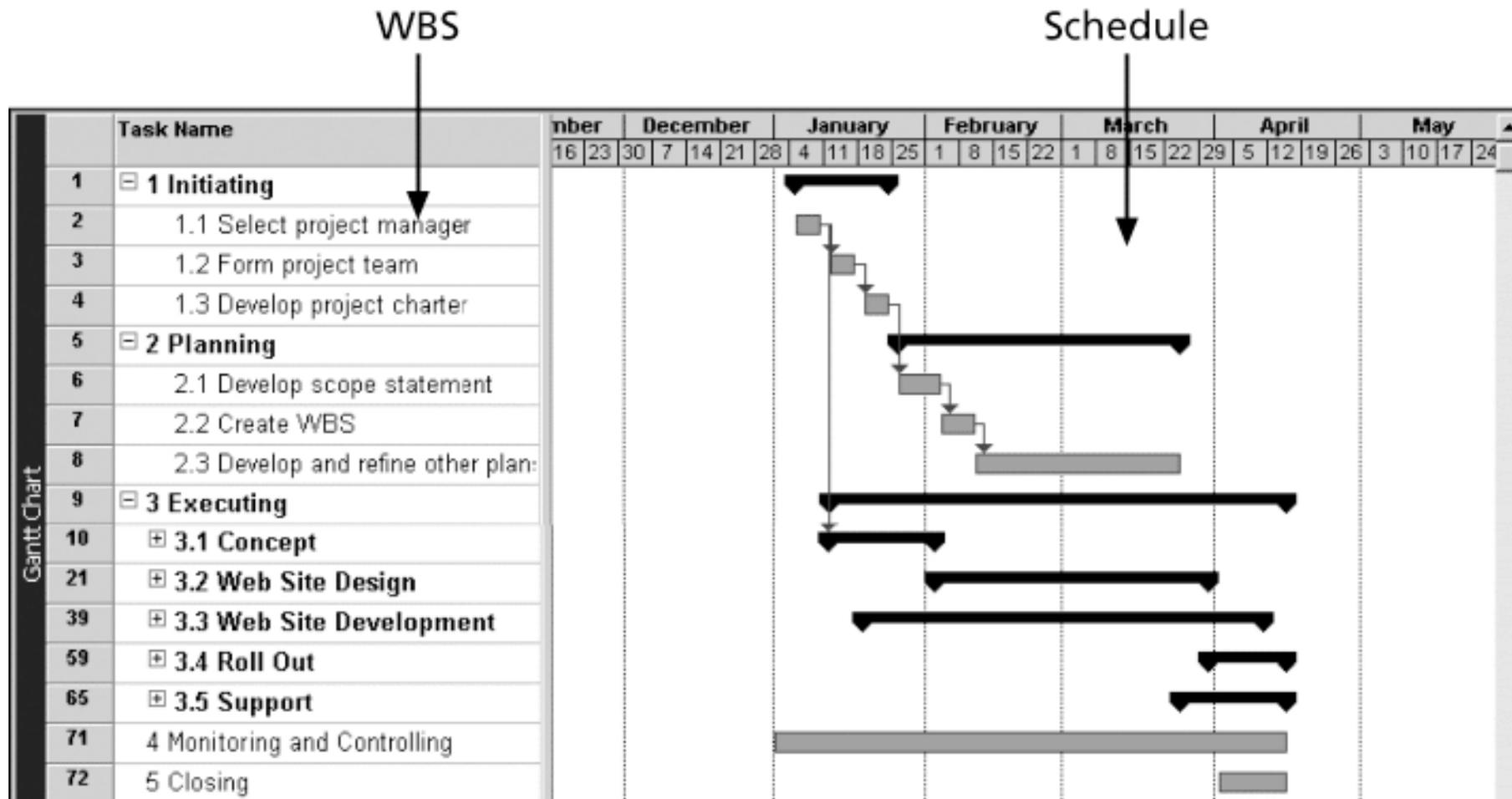
EXECUTING TASKS FOR JWD CONSULTING'S WBS

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   Intranet site testing
3.7   Intranet site roll-out
3.8   Site rollout
3.9   Intranet site roll-out

APPROACHES TO DEVELOPING WBSS

1. Using guidelines: Some organizations, like the DOD, provide guidelines for preparing WBSs
2. The **analogy approach**: Review WBSs of similar projects and tailor to your project
3. The **top-down approach**: Start with the largest items of the project and break them down
4. The **bottom-up approach**: Start with the specific tasks and roll them up
5. Mind-mapping approach: **Mind mapping** is a technique that uses branches radiating out from a core idea to structure thoughts and ideas
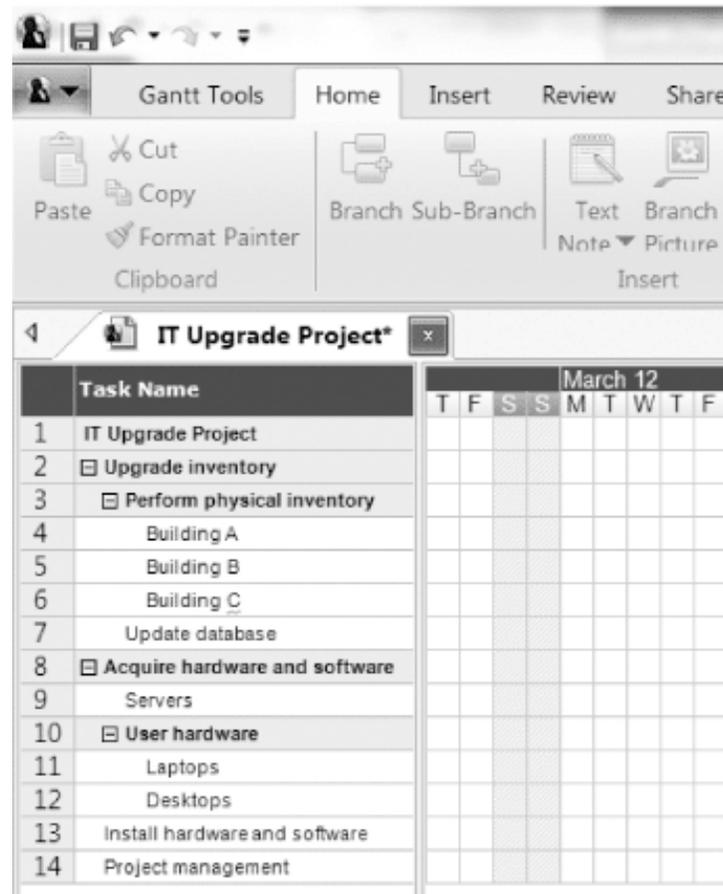
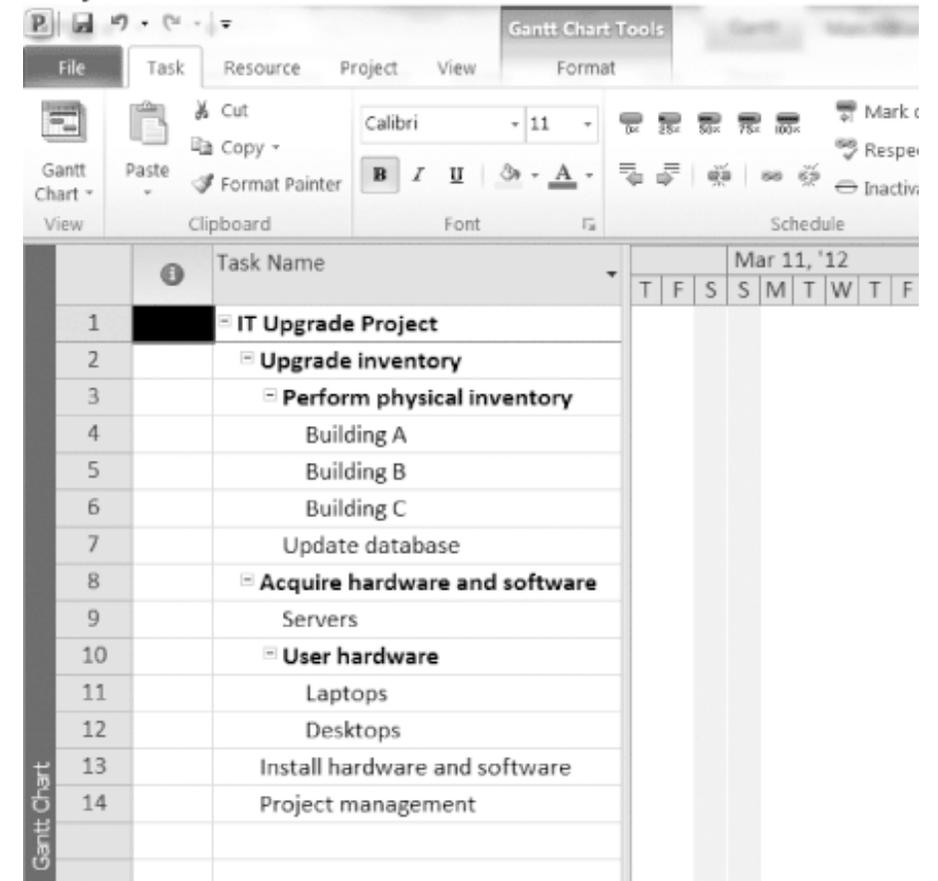# SAMPLE MIND-MAPPING APPROACH FOR CREATING A WBS
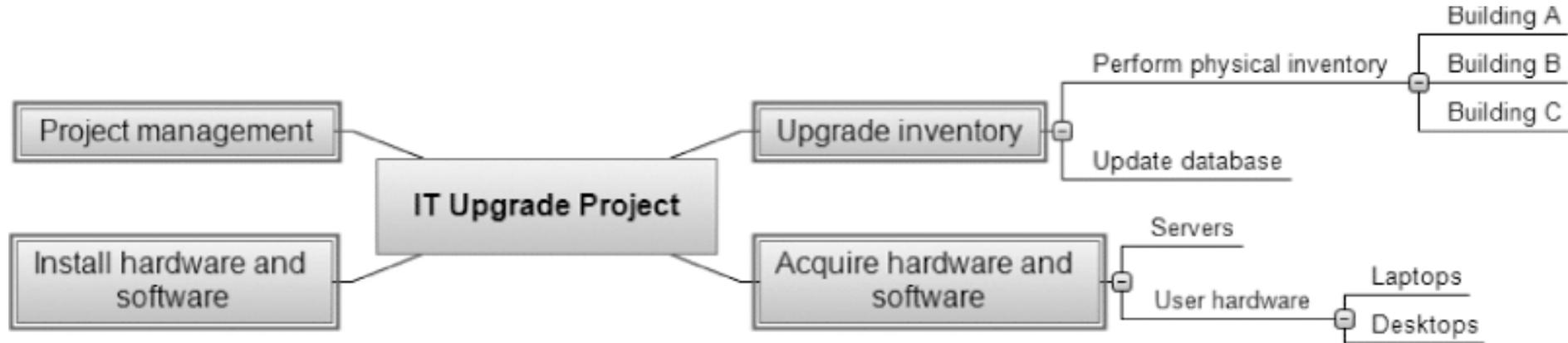
Source: MatchWare's MindView 4 Business Edition

GANTT CHARTS WITH WBS GENERATED FROM A MIND MAP

MindView 4.0 Gantt Chart

Project 2010 Gantt Chart

THE WBS DICTIONARY AND SCOPE BASELINE

- 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** is a document that describes detailed information about each WBS item

| WBS Dictionary Entry March 20 |
|---|
| **Project Title:** Information Technology (IT) Upgrade Project |
| **WBS Item Number:** 2.2 |
| **WBS Item Name:** Database Update |
| **Description:** The IT department maintains an online database of hardware and software on the corporate intranet. 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 |

ADVICE FOR CREATING A WBS AND WBS DICTIONARY

- A unit of work should appear at only one place in the WBS.

- The work content of a WBS item is the sum of the WBS items below it

- A WBS item is the responsibility of only one individual, even though many people may be working on it

- The WBS must be consistent with the way in which work is actually going to be performed; it should serve the project team first, and other purposes only if practical

- Project team members should be involved in developing the WBS to ensure consistency and buy-in

- Each WBS item must be documented in a WBS dictionary to ensure accurate understanding of the scope of work included and not included in that item

- The WBS must be a flexible tool to accommodate inevitable changes while properly maintaining control of the work content in the project according to the scope statement

WHAT WENT WRONG?

- A project scope that is too broad and grandiose can cause severe problems
  - Scope creep and an overemphasis on technology for technology's sake resulted in the bankruptcy of a large pharmaceutical firm, Texas-based FoxMeyer Drug
  - In 2001, McDonald's fast-food chain initiated a project to create an intranet that would connect its headquarters with all of its restaurants to provide detailed operational information in real time. After spending $170 million on consultants and initial implementation planning, McDonald's realized that the project was too much to handle and terminated it

PART 2.A: VALIDATING SCOPE
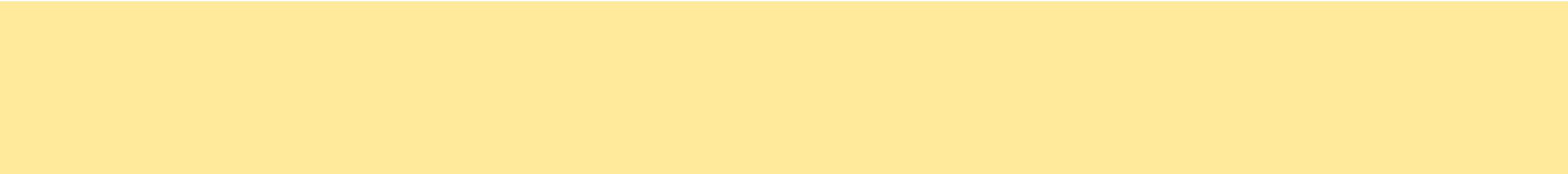
VALIDATING SCOPE

- 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

- Even when the project scope is fairly well defined, many IT projects suffer from **scope creep**—the tendency for project scope to keep getting bigger and bigger.

- **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

- To minimize scope changes, it is crucial to do a good job of configuration management and validating project scope

- The main outputs of scope validation are accepted deliverables, change requests, work performance information, and project documents updates

GLOBAL ISSUES

- Many countries have had difficulties controlling the scope of large projects, especially those that involve advanced technologies and many different users

- For example, the state government of Victoria, Australia, has a Web site for its public transportation smart card at www.myki.com.au.

- There were many problems in developing and implementing the smart card

PART 2.B: CONTROLLING SCOPE
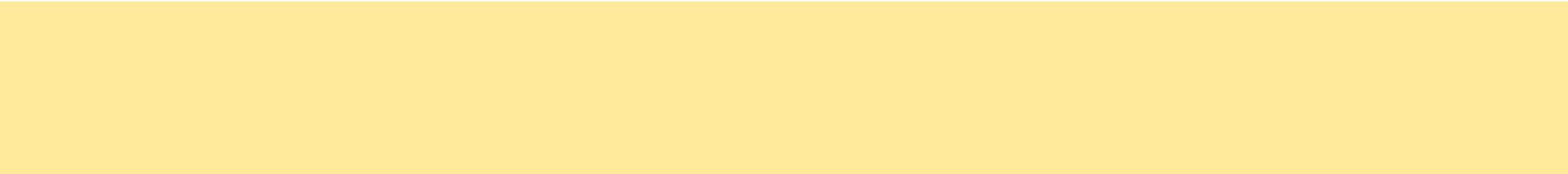
CONTROLLING SCOPE

- 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** is the difference between planned and actual performance

- You cannot do a good job of controlling scope if you do not first do a good job of collecting requirements, defining scope, and validating scope.

- Stakeholders should be encouraged to suggest changes that will benefit the overall project and discouraged from suggesting unnecessary changes

- To avoid project failures, therefore, it is crucial for IT project managers and their teams to improve user input and executive support and reduce incomplete and changing requirements

SUGGESTIONS FOR IMPROVING USER INPUT

- Develop a good project selection process and insist that sponsors are from the user organization
- Have users on the project team in important roles
- Have regular meetings with defined agendas, and have users sign off on key deliverables presented at meetings
- Deliver something to users and sponsors on a regular basis
- Don't promise to deliver when you know you can't
- Co-locate users with developers

SUGGESTIONS FOR REDUCING INCOMPLETE AND CHANGING REQUIREMENTS

- Develop and follow a requirements management process
- Use techniques such as prototyping, use case modeling, and JAD to get more user involvement
- Put requirements in writing and keep them current
- Create a requirements management database for documenting and controlling requirements
- Provide adequate testing and conduct testing throughout the project life cycle
- Review changes from a systems perspective
- Emphasize completion dates to help focus on what's most important
- Allocate resources specifically for handling change requests/enhancements like NWA did with ResNet

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
- Specialized software is available to assist in project scope management

PART 2.C: CONSIDERATIONS FOR AGILE/ADAPTIVE ENVIRONMENTS

CONSIDERATIONS FOR AGILE/ADAPTIVE ENVIRONMENTS (THE *PMBOK® GUIDE – SIXTH EDITION*)

- In projects with evolving requirements, high risk, or significant uncertainty, the **scope is often not understood at the beginning** of the project or it evolves during the project.

- Agile methods deliberately spend less time trying to define and agree on scope in the early stage of the project and spend more time establishing the process for its **ongoing discovery and refinement**.

- Many environments with emerging requirements find that there is often a gap between the real business requirements and the business requirements that were originally stated.

- Therefore, agile methods purposefully build and review prototypes and release versions in order to refine the requirements. As a result, scope is defined and redefined throughout the project. In agile approaches, the requirements constitute **the backlog**.

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