College of Computer and Information Science
Malayan Colleges Laguna

MALAYAN COLLEGES LAGUNA ONLINE

Module 2.2:

Project Scope Management

IT124P Project Management

Project Scope Management?

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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

Project Scope Management Processes

- **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
- **Verifying scope**: formalizing acceptance of the project deliverables
- **Controlling scope**: controlling changes to project scope throughout the life of the project

Figure 5-1. Project Scope Management Summary

Planning
Process: **Collect requirements**
Outputs: Requirements documentation, requirements management plan, requirements traceability matrix Process: **Define scope**
Outputs: Project scope statement, project document updates Process: **Create WBS**
Outputs: WBS, WBS dictionary, scope baseline, project document update -►

Monitoring and Controlling Process: **Verify scope**
Outputs: Accepted deliverables, change requests, project document updates Process: **Control Scope**
Outputs: Work performance measurements, organizational process assets updates, change requests, project management plan updates, project document updates

Project Start

Project Finish

Collecting Requirements

- A **requirement** is "a condition or capability that must be met or possessed by a system, product, service, result, or component to satisfy a contract, standard, specification, or other formal document" 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

Collect Requirements Process

Project charter

Stakeholder register

Interviews Focus groups Facilitated workshops Group creativity techniques

Group decision making techniques

Questionnaires and surveys Observations

Prototypes

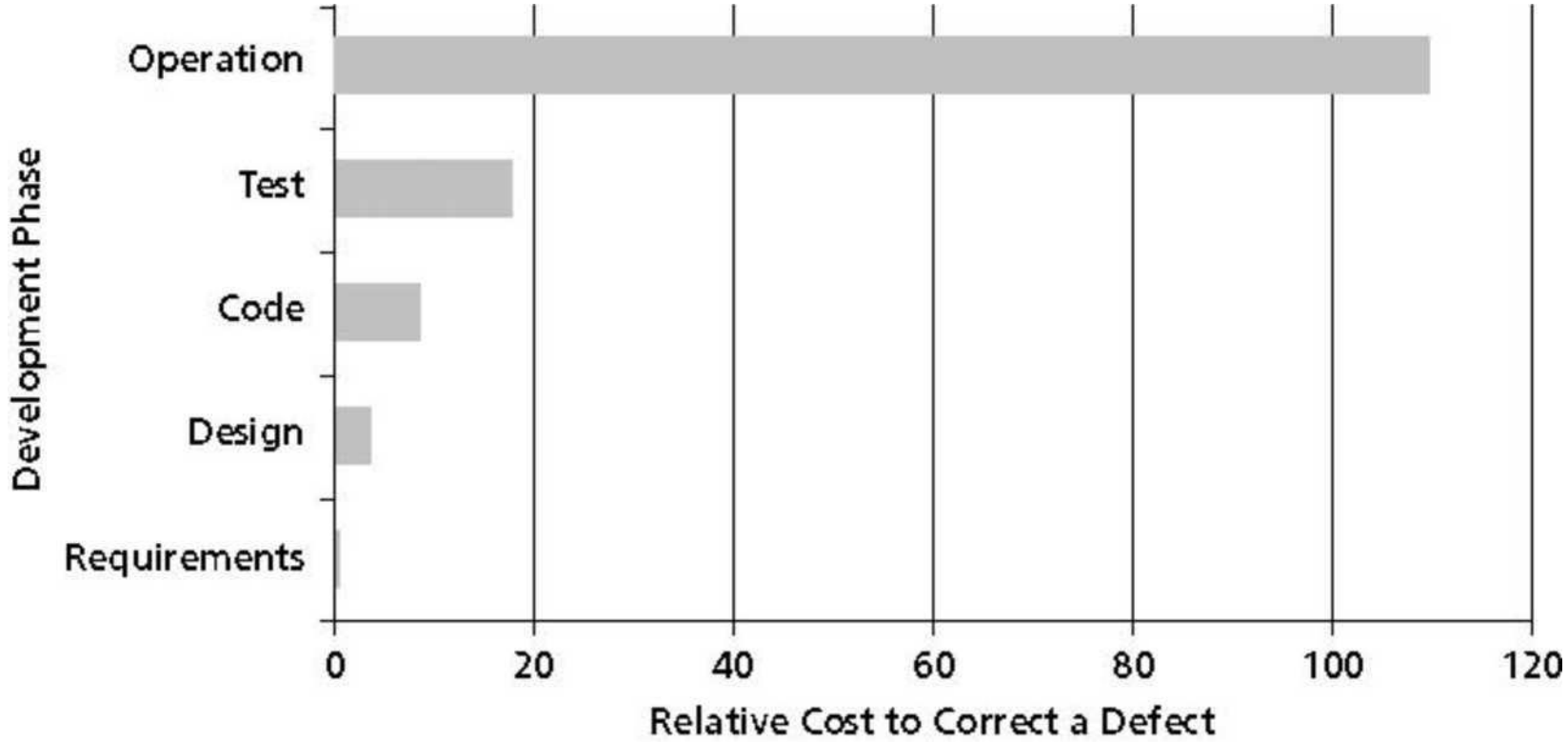
Outputs

Requirements documentation

Requirements management plan

Requirements traceability matrix

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



Source: Robert B. Grady, "An Economic Release Decision Model: Insights into Software Project Management." *Proceedings of the Applications of Software Measurement Conference* (Orange Park, FL: Software Quality Engineering, 1999), pp.227–239.

Methods for Collecting Requirements

- Interviewing
- Focus groups and facilitated workshops
- Using group creativity and decision- making techniques
- Questionnaires and surveys
- Observation
- Prototyping
- Software tools

Documenting Requirements

- Requirements documents are often generated by software and include text, images, diagrams, videos, and other media; they are often broken down into different categories such as functional, service, performance, quality, training requirements, and so on
- A **requirements management plan** describes how project requirements will be analyzed, documented, and managed
- 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

Table 5-1. Sample entry in a requirements traceability matrix

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

Defining Scope

- Key inputs for preparing the project scope statement include the project charter, requirements documentation, and organizational process assets such as policies and procedures related to scope statements as well as project files and lessons learned from previous, similar projects
- As time progresses, the scope of a project should become more clear and specific

Table 5-2. Sample project charter

Project Title: Information Technology (IT) Upgrade Project

Project Start Date: March 4 **Projected Finish Date:** December 4

Key Schedule Milestones:

- Inventory update completed April 15
- Hardware and software acquired August 1
- Installation completed October 1
- Testing completed November 15

Budget Information: Budgeted $1,000,000 for hardware and software costs and $500,000 for labor costs.

Project 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.

ROLES AND RESPONSIBILITIES		
Name	**Role**	**Responsibility**
Walter Schmidt	CEO	Project sponsor, monitor project
Mike Zwack	CIO	Monitor project, provide staff
Kim Nguyen	Project Manager	Plan and execute project
Jeff Johnson	Director of IT Operations	Mentor Kim
Nancy Reynolds	VP, Human Resources	Provide staff, issue memo to all employees about project
Steve McCann	Director of Purchasing	Assist in purchasing hardware and software
Sign-off: (Signatures of all the above stakeholders)		

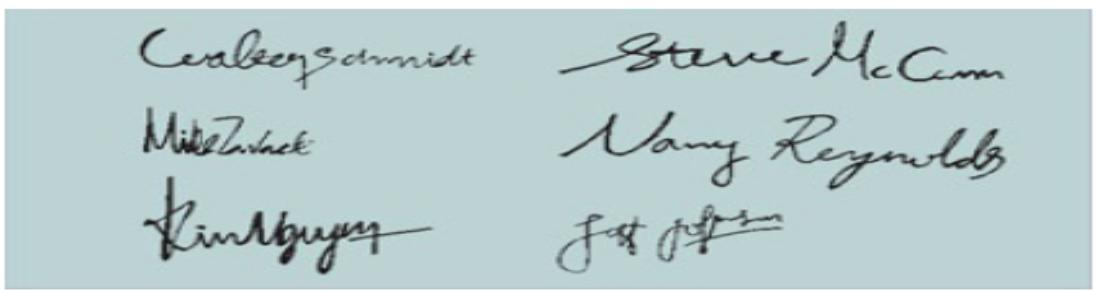


Table 5-3. Further defining project scope

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 10 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 Attachment 8, along with a plan describing where they will be located.

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

Figure 5-3. Sample intranet WBS organized by product

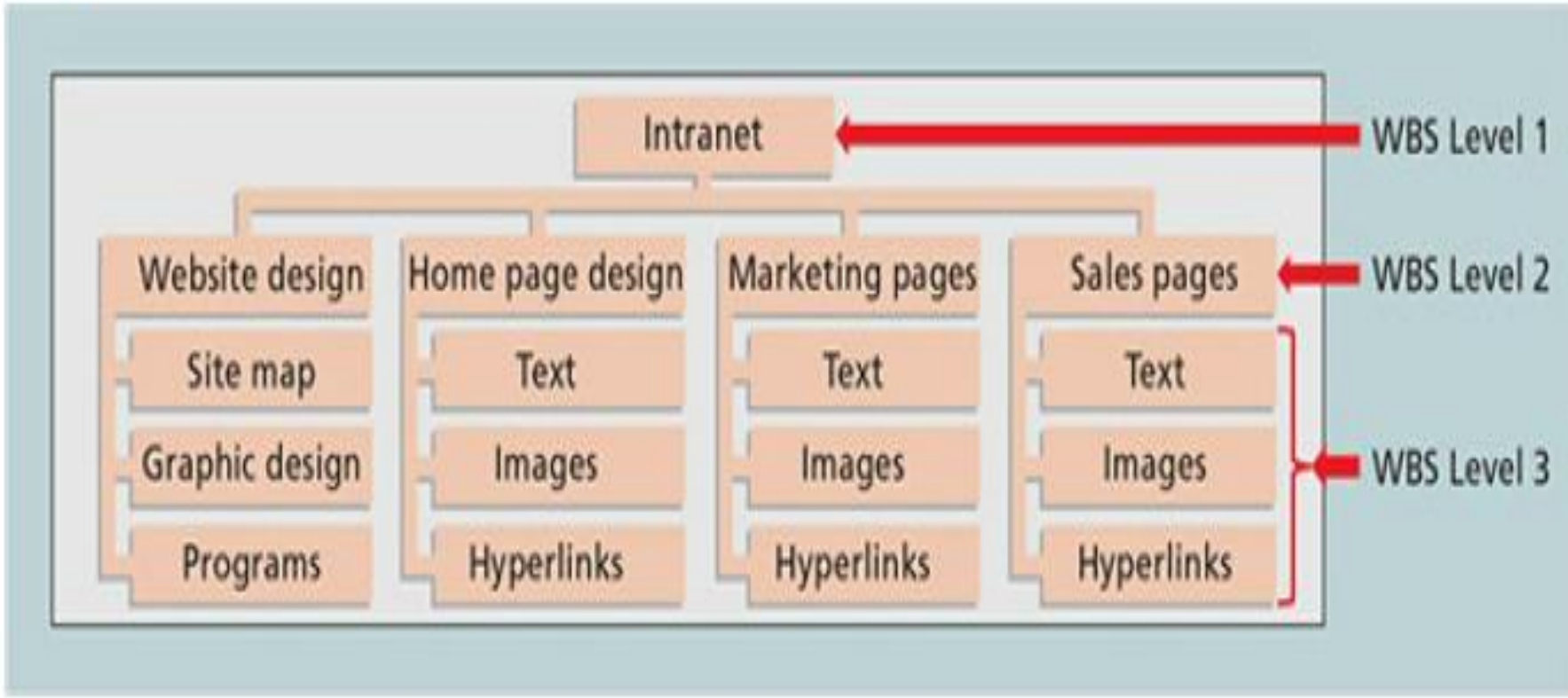


Figure 5-4. Sample intranet WBS organized by phase in chart and tabular form

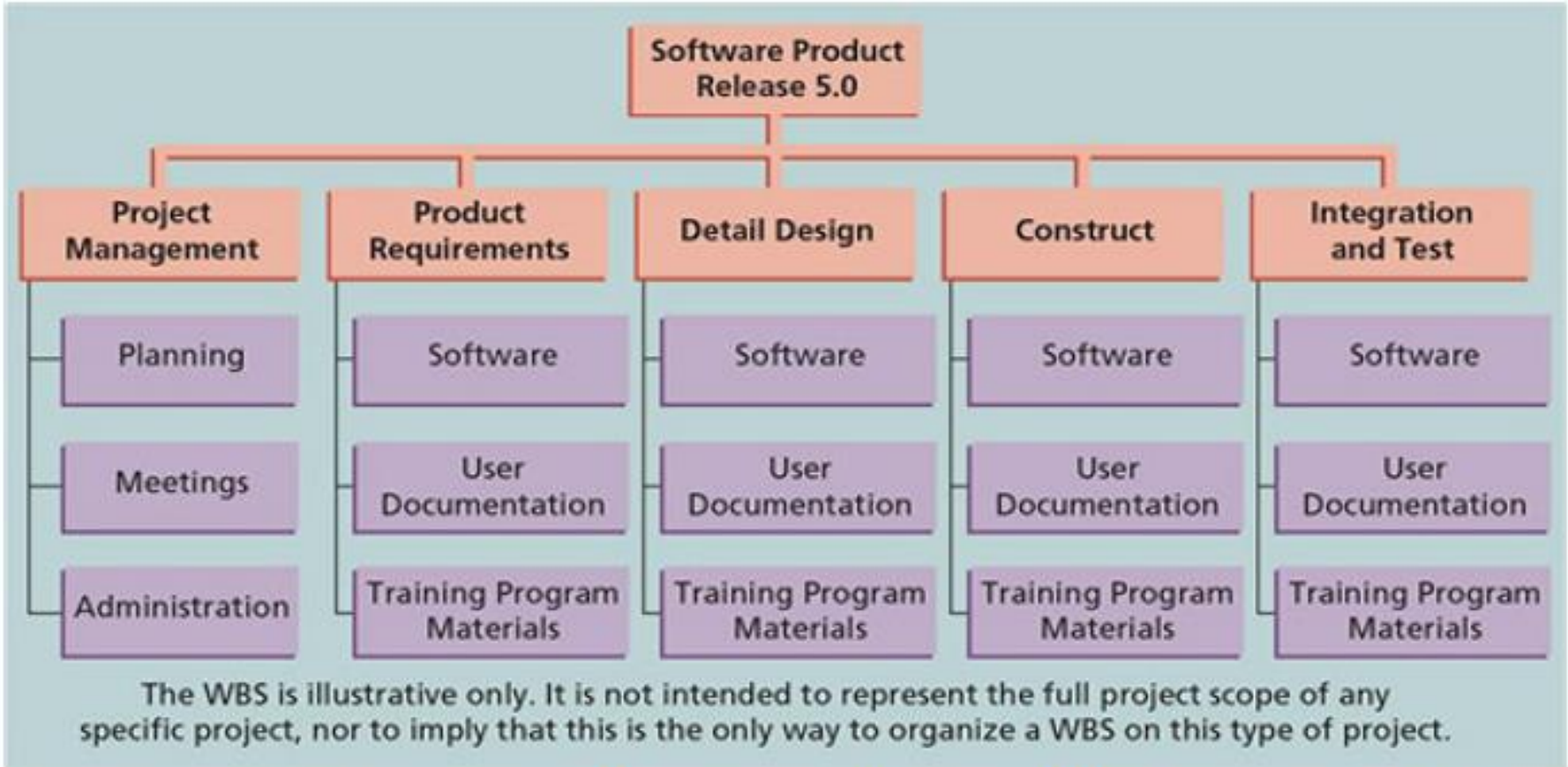


Table 5-4. Tabular form of WBS

1.0 Software Product Release 5.0
- 1.1 Project Management
  - 1.1.1 Planning
  - 1.1.2 Meetings
  - 1.1.3 Administration
- 1.2 Product Requirements
  - 1.2.1 Software
  - 1.2.2 User Documentation
  - 1.2.3 Training Program Materials
- 1.3 Detail Design
  - 1.3.1 Software
  - 1.3.2 User Documentation
  - 1.3.3 Training Program Materials
- 1.4 Construct
  - 1.4.1 Software
  - 1.4.2 User Documentation
  - 1.4.3 Training Program Materials
- 1.5 Integration and Test
  - 1.5.1 Software
  - 1.5.2 User Documentation
  - 1.5.3 Training Program Materials

Figure 5-5. Software development project template from Microsoft Project 2016

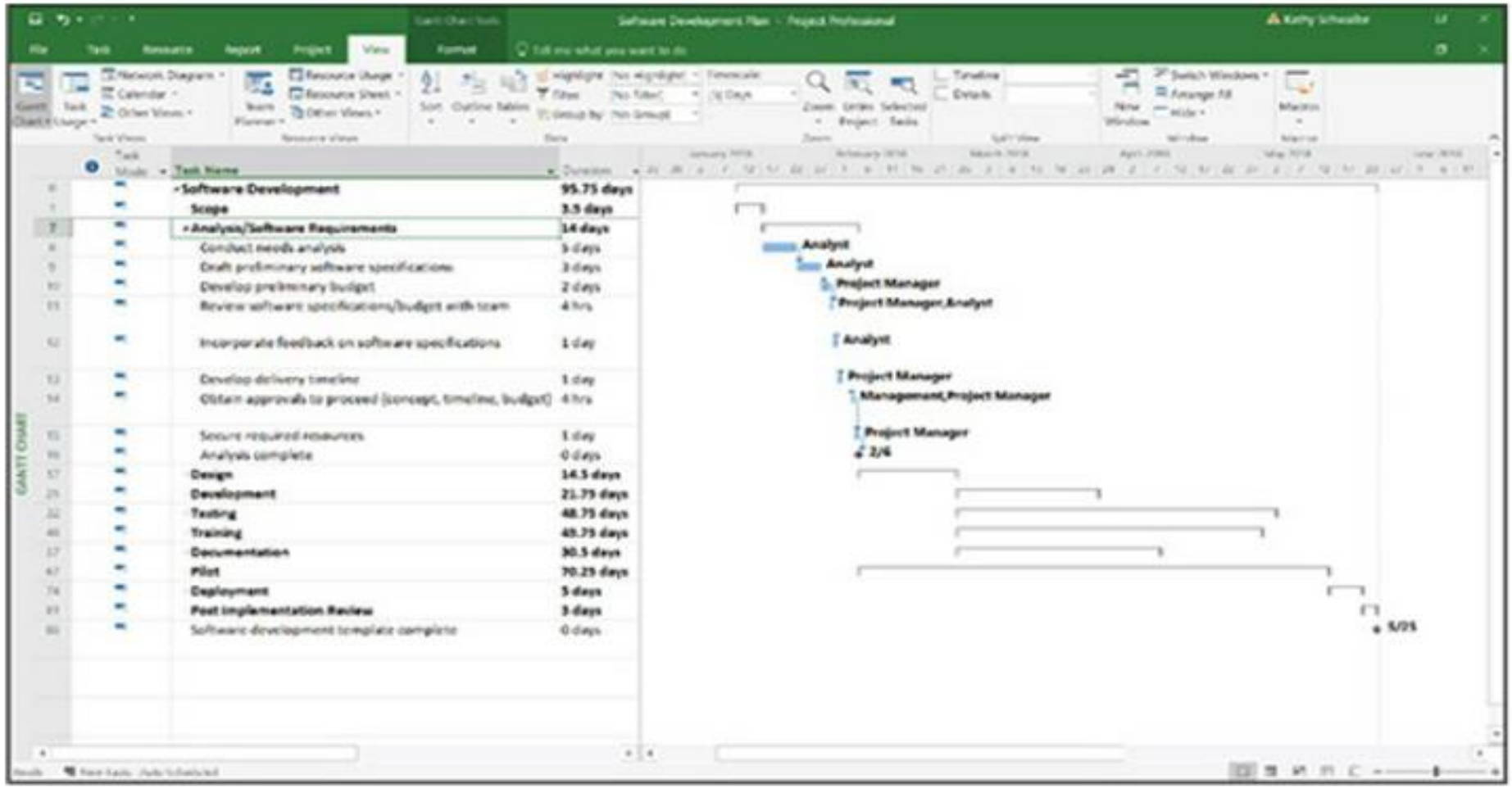


Figure 5-5. Intranet WBS and Gantt Chart in Microsoft Project

WBS **Schedule**

	Task Name	January	February	March	April Mi
		4 11 18 25	1 8 15 22	1 8 15 22 29	5 12 19 26 3 10
1	B ***1 Concept*** ▼				
2	1.1 Evaluate current systems				
3	B **1.2 Define Requirements**				
4	1.2.1 Define user requirements				
5	1.2.2 Define content requirements				
6	1.2.3 Define system requirements				
7	1.2.4 Define server owner requirements				
8	1.3 Define specific functionality				
9	1.4 Define risks and risk management approach				
10	1.5 Develop project plan				
11	1.6 Brief Web development team				
12	0 ***2 Web Site Design***				
30	0 ***3 Web Site Deveiopment***				
50	® ***4 Roil Out***				
57	0 ***5*** **Support**				

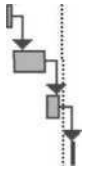


Figure 5-6. Website project Gantt chart organized by project management process groups

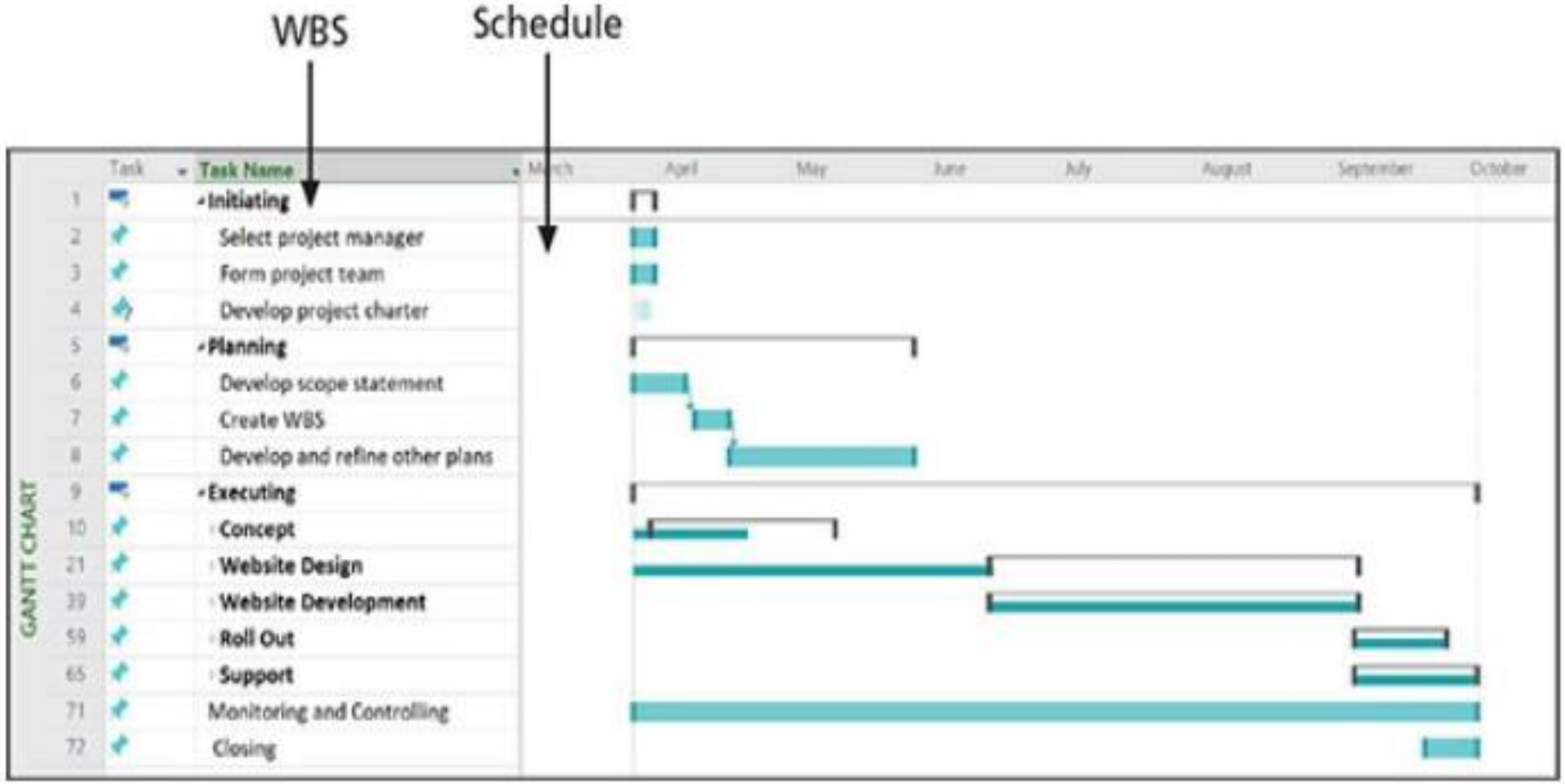


Table 5-4. Executing Tasks for JWD Consulting's WBS

1. Executing
    2. Survey
    3. User inputs
    4. Intranet site content
        1. Templates and Tools
        2. Articles
        3. Links
        4. Ask the Expert
        5. User requests feature
    5. Intranet site design
    6. Intranet site construction
    7. Site testing
    8. Site promotion
    9. Site roll out

Approaches to Developing WBSs

- Using guidelines: some organizations, like the DOD, provide guidelines for preparing WBSs
- The **analogy approach**: review WBSs of similar projects and tailor to your project
- The **top-down approach**: start with the largest items of the project and break them down
- The **bottom-up approach**: start with the specific tasks and roll them up
- Mind-mapping approach: **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

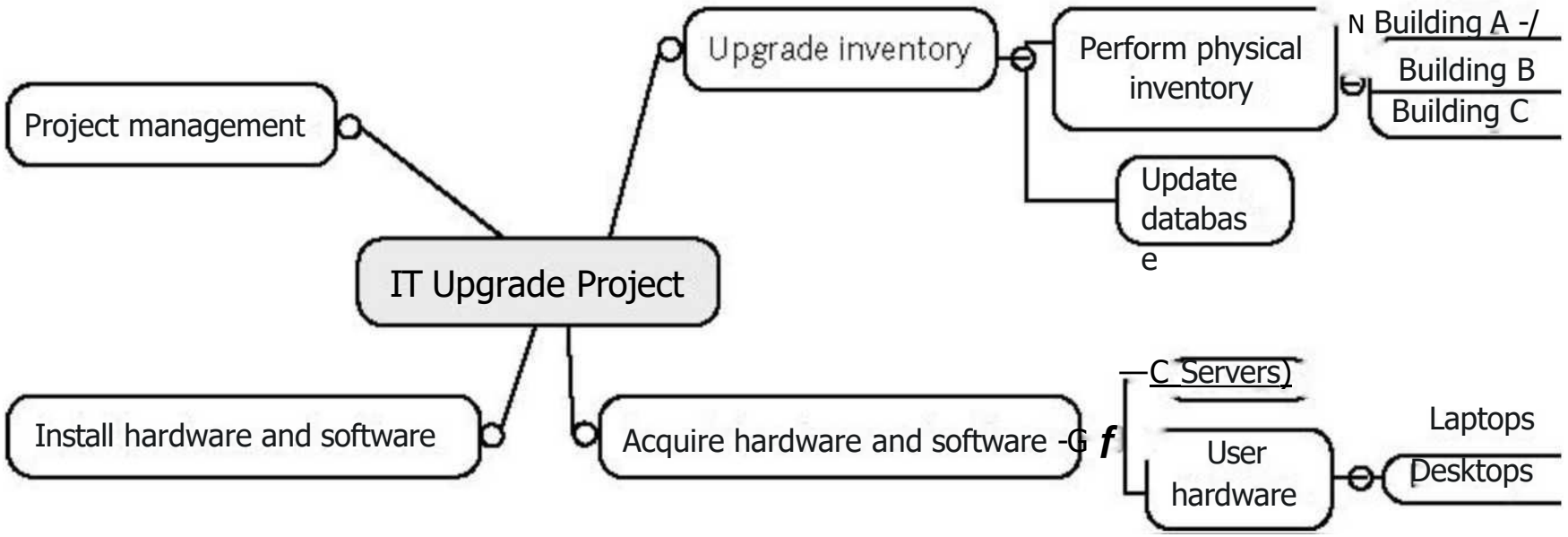
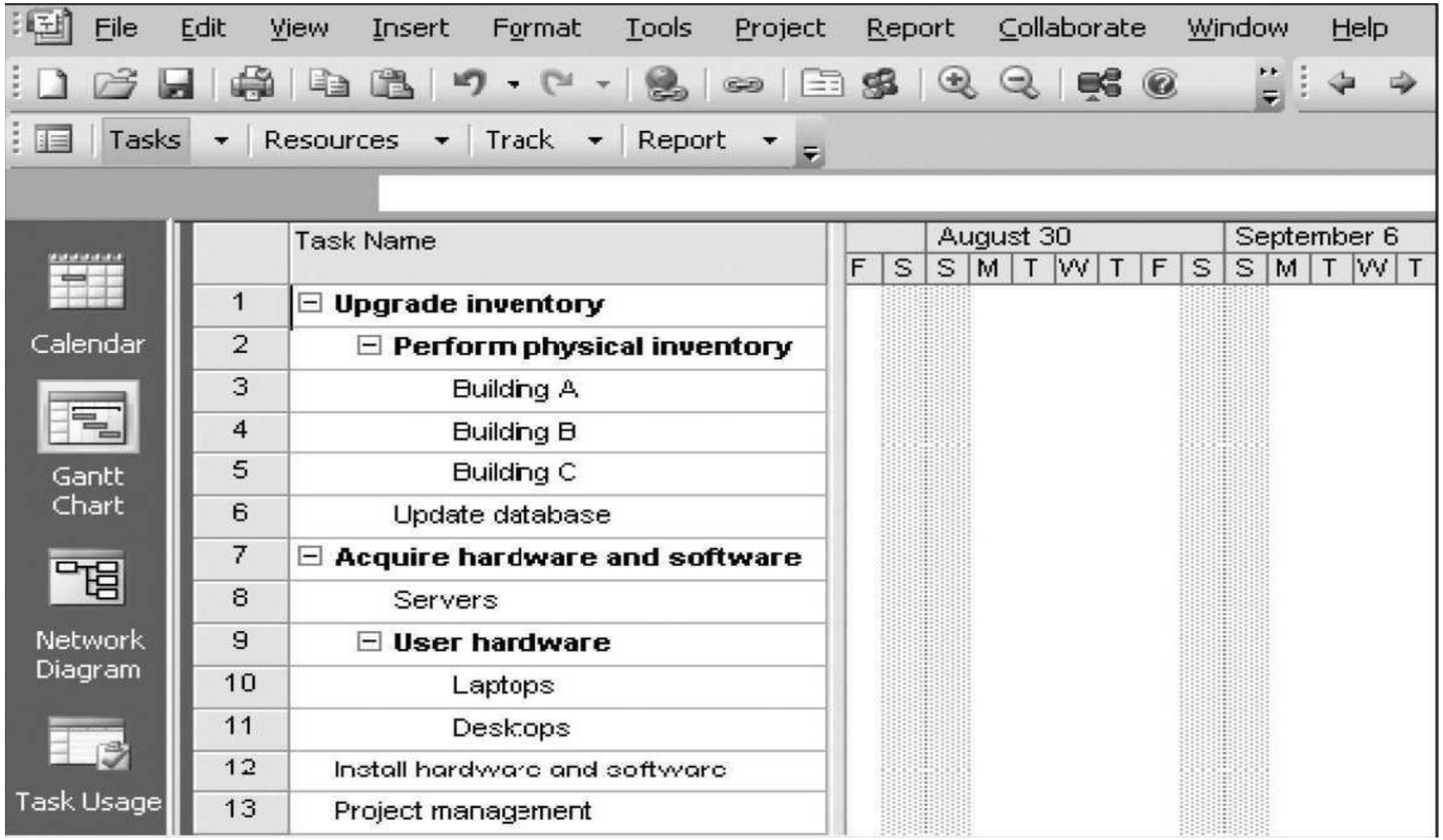


Figure 5-8. Project 2007 File with WBS Generated from a Mind Map



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
- The approved project scope statement and its WBS and WBS dictionary form the **scope baseline**, which is used to measure performance in meeting project scope goals

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

Advice for Creating a WBS and WBS Dictionary (continued)

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

Verifying 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
- **Scope verification** involves formal acceptance of the completed project scope by the stakeholders
- Acceptance is often achieved by a customer inspection and then sign-off on key deliverables

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
  - Manage changes when they occur
- **Variance** is the difference between planned and actual performance

Best Practices for Avoiding Scope Problems

1. Keep the scope realistic. Don't make projects so large that they can't be completed. Break large projects down into a series of smaller ones.
2. Involve users in project scope management. Assign key users to the project team and give them ownership of requirements definition and scope verification.
3. Use off-the-shelf hardware and software whenever possible. Many IT people enjoy using the latest and greatest technology, but business needs, not technology trends, must take priority.
4. Follow good project management processes. As described in this chapter and others, there are well-defined processes for managing project scope and others aspects of projects.

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

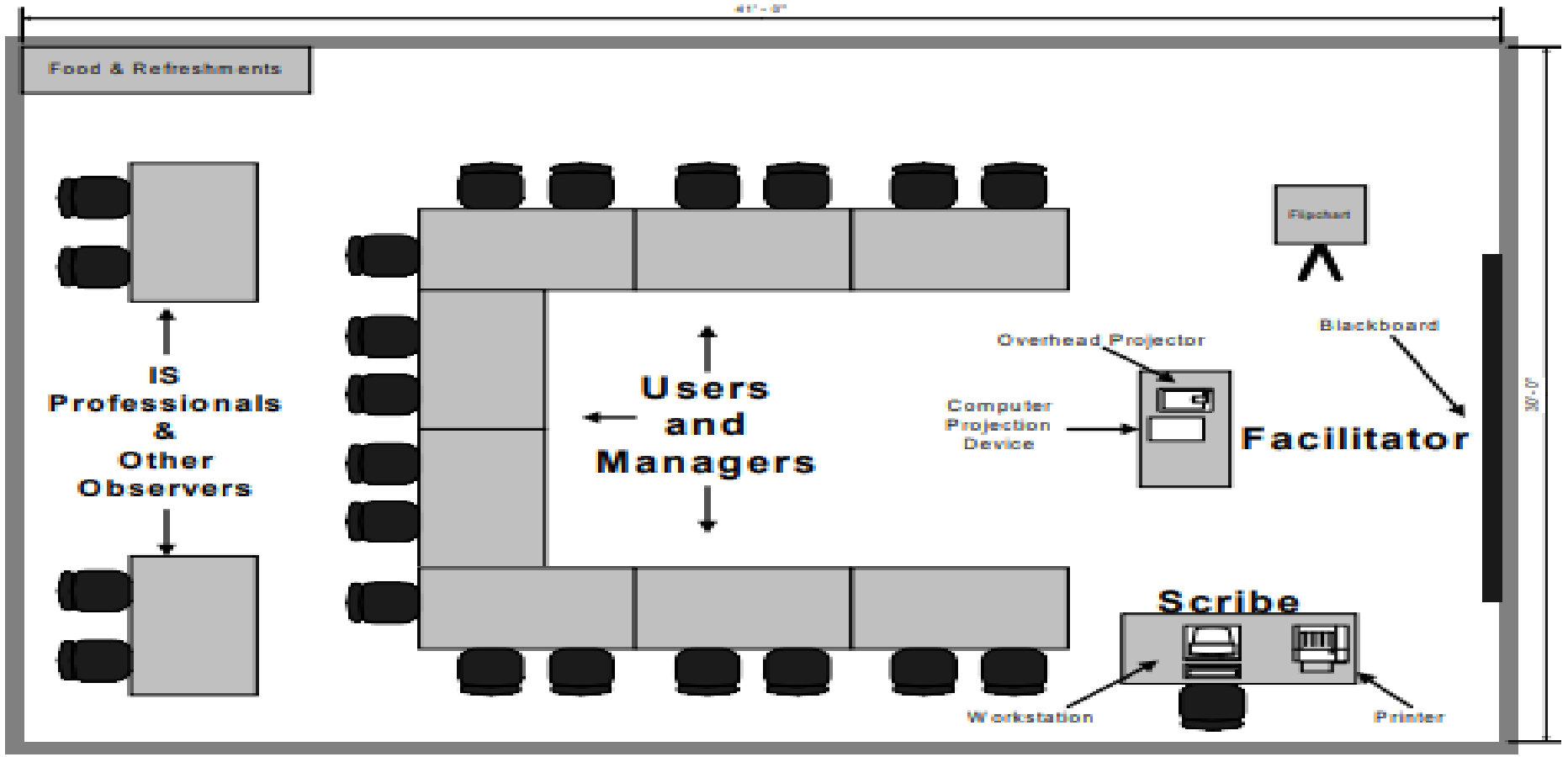
- Develop and follow a requirements management process
- Use techniques such as prototyping, use case modeling, and Joint Application Development (JAD) to get more user involvement
- Put requirements in writing and keep them current
- Create a requirements management database for documenting and controlling requirements

- **JAD** is a technique that allows the developments, management, and customer groups to work together to build a product.

- It is a series of highly structured interviewed sessions aimed at reaching consensus on a project's goal and scope.

- A typical JAD project is from 3 to 6 months.

Typical JAD Meeting Room



Suggestions for Reducing Incomplete and Changing Requirements (continued)

- 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.

Using Software to Assist in Project Scope Management

- Word-processing software helps create several scope-related documents
- Spreadsheets help to perform financial calculations and weighted scoring models and to 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