Scope Management

Learning Objectives

- Understand the importance of good project scope management
- Discuss methods for collecting and documenting requirements
- Explain the scope definition process
- Discuss the process for creating a work breakdown structure
- Explain the importance of verifying and controlling scope

What is Project Scope Management?

- **Scope**: *all* the work involved in creating the deliverables and processes used to create them
- **Deliverable: A** product produced as part of a project. E.g. hardware, software, planning documents, meeting minutes
- Project scope management includes processes involved in defining and controlling what is or is not included in a project

Project Scope Vs. Project Objectives

- Project Scope refers to the amount of the effort required to complete a project
- Project Objectives refers to a detailed description of the expected / desired outcome of the project
- Example: Project Objectives could be to build a new website, Project Scope could be to build the website using ASP & .NET products and Flash media

Project Scope Vs. Product Scope

- Project Scope
  - The work that must be done in order to deliver a product or service with the specified features and functions. Completion of the project scope is measured against
    - The Project Management plan
    - Project scope statement, WBS and WBS dictionary
- Product Scope
  - The features and functions that characterize a product/service/result. Completion of the product scope is measured against
    - Product Requirements

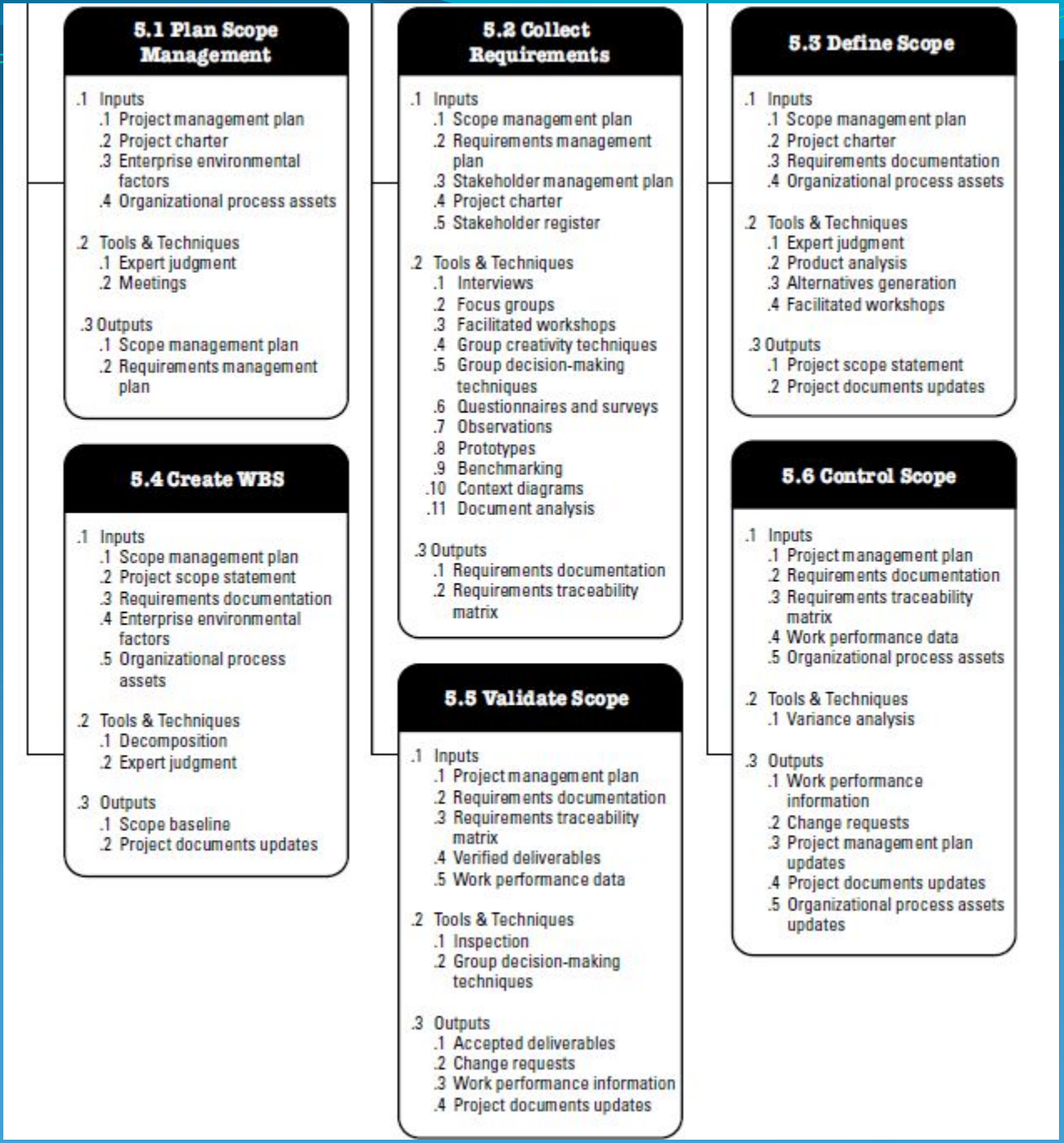
Project Scope Management Processes

- Plan Scope Management: process of creating a scope management plan
- Collect requirements: defining and documenting the features and functions of the products to be produced and 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

Next Steps

- Once the Project Charter and the Project Scope Statement is released by the customer, only then does the PM and the project team come into picture. The very next step is to create the Scope Management Plan

Overview


5.1 Plan Scope Management
.1 Inputs
.1 Project management plan
.2 Project charter
.3 Enterprise environmental factors
.4 Organizational process assets
.2 Tools & Techniques
.1 Expert judgment
.2 Meetings
.3 Outputs
.1 Scope management plan
.2 Requirements management plan
5.2 Collect Requirements
.1 Inputs
.1 Scope management plan
.2 Requirements management plan
.3 Stakeholder management plan
.4 Project charter
.5 Stakeholder register
.2 Tools & Techniques
.1 Interviews
.2 Focus groups
.3 Facilitated workshops
.4 Group creativity techniques
.5 Group decision-making techniques
.6 Questionnaires and surveys
.7 Observations
.8 Prototypes
.9 Benchmarking
.10 Context diagrams
.11 Document analysis
.3 Outputs
.1 Requirements documentation
.2 Requirements traceability matrix
5.3 Define Scope
.1 Inputs
.1 Scope management plan
.2 Project charter
.3 Requirements documentation
.4 Organizational process assets
.2 Tools & Techniques
.1 Expert judgment
.2 Product analysis
.3 Alternatives generation
.4 Facilitated workshops
.3 Outputs
.1 Project scope statement
.2 Project documents updates
5.4 Create WBS
.1 Inputs
.1 Scope management plan
.2 Project scope statement
.3 Requirements documentation
.4 Enterprise environmental factors
.5 Organizational process assets
.2 Tools & Techniques
.1 Decomposition
.2 Expert judgment
.3 Outputs
.1 Scope baseline
.2 Project documents updates
5.5 Validate Scope
.1 Inputs
.1 Project management plan
.2 Requirements documentation
.3 Requirements traceability matrix
.4 Verified deliverables
.5 Work performance data
.2 Tools & Techniques
.1 Inspection
.2 Group decision-making techniques
.3 Outputs
.1 Accepted deliverables
.2 Change requests
.3 Work performance information
.4 Project documents updates
5.6 Control Scope
.1 Inputs
.1 Project management plan
.2 Requirements documentation
.3 Requirements traceability matrix
.4 Work performance data
.5 Organizational process assets
.2 Tools & Techniques
.1 Variance analysis
.3 Outputs
.1 Work performance information
.2 Change requests
.3 Project management plan updates
.4 Project documents updates
.5 Organizational process assets updates

Plan Scope Management

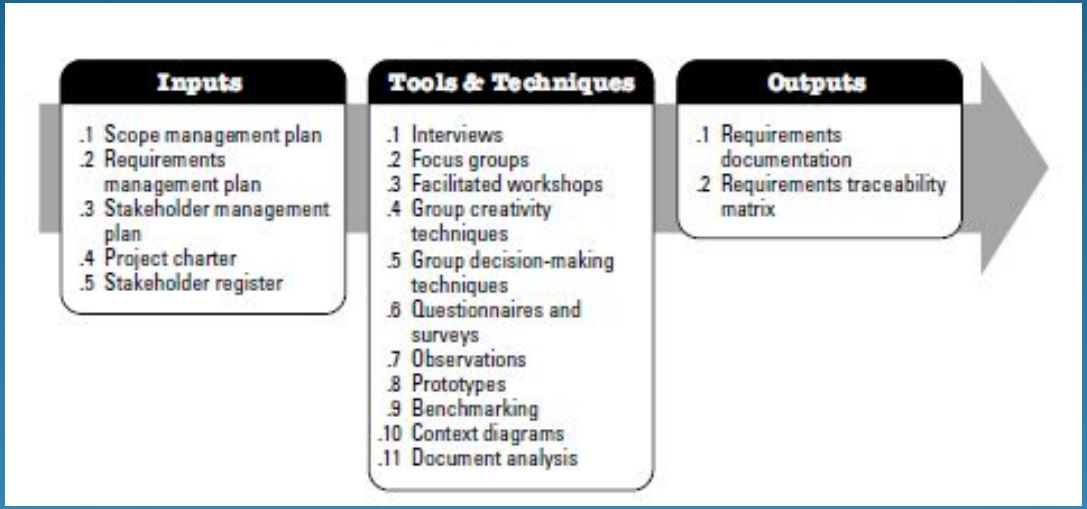
- Primary purpose is to create Scope Management Plan

- Scope Management plan is a component of the project or program management plan that describes how the scope will be defined, developed, monitored, controlled, and verified. Component includes:
  - Process for preparing a detailed project scope statement;
  - Process that enables the creation of the WBS;
  - Process that establishes how the WBS will be maintained and approved;
  - Process that specifies how formal acceptance of the completed project deliverables will be obtained; and
  - Process to control how requests for changes to the detailed project scope statement will be processed.
- Requirements Management plan describes how requirements will be analyzed, documented, and managed. Component includes
  - How requirements activities will be planned, tracked, and reported;
  - Configuration management activities – changes to be initiated, traced, tracked, approval process and reported;
  - Requirements prioritization process;
  - Product metrics;
  - Traceability matrix.

Collect Requirements

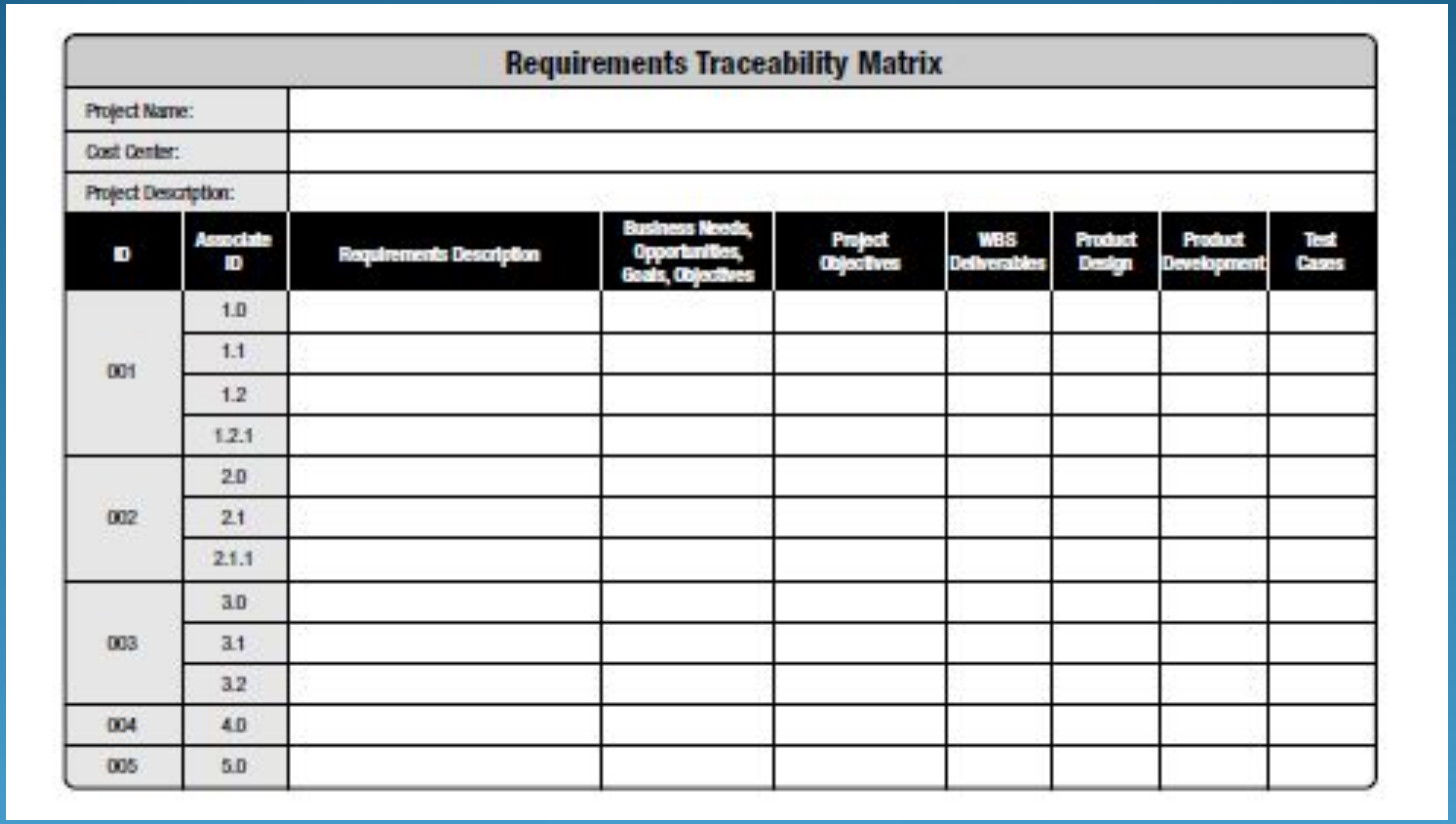
- A **requirement** is "a condition or capability that must be met or possessed by a system, product, service, result, or component to satisfy a contract, standard, specification, or other formal document" (PMBOK® Guide, 5th edition)
- Collect requirements is the process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives
- 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



- Requirements documentation describes how individual requirements meet the business need for the product
- Requirements documentation are often generated by software and include text, images, diagrams, videos, and other media
- They are broken down into different categories such as functional, service, performance, quality, etc.
- A requirements traceability matrix (RTM) is a table that lists requirements, various attributes of each requirement, and the status of the requirements

Sample Requirements Traceability Matrix



Requirements Traceability Matrix

Project Name:	
Cost Center:	
Project Description:	

ID	Associate ID	Requirements Description	Business Needs, Opportunities, Goals, Objectives	Project Objectives	WBS Deliverables	Product Design	Product Development	Test Cases
001	1.0							
	1.1							
	1.2							
	1.2.1							
002	2.0							
	2.1							
	2.1.1							
003	3.0							
	3.1							
	3.2							
004	4.0							
005	5.0							

Define Scope

- Define Scope is the process of developing a detailed description of the project and product
- Describes what is and not included in the project scope

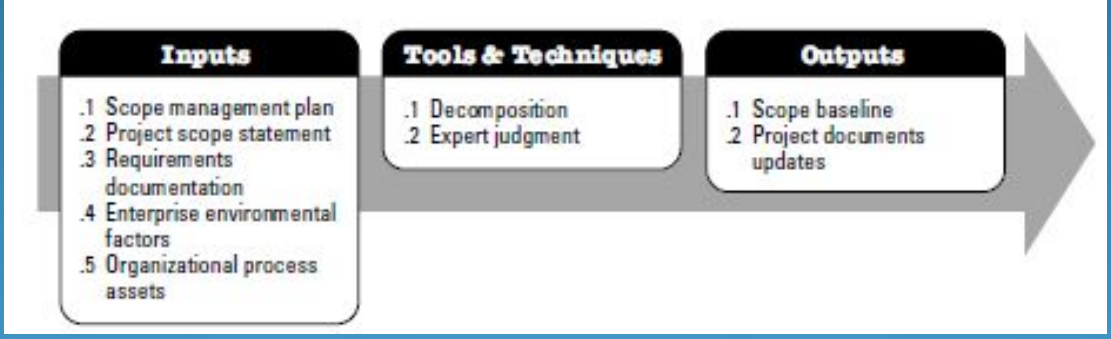
- Product analysis: includes techniques such as
  - Product breakdown,
  - Systems analysis,
  - Requirements analysis,
  - Systems engineering,
  - Value engineering, and
  - Value analysis

Define Scope - Output

- Project Scope Statement is the description of the project scope, major deliverables, assumptions, and constraints
- Documents the entire scope, including project and product scope
- Details the project's deliverables and the work required to create those deliverables
- Creates the common understanding of the project scope among project stakeholders
- Includes:
  - Product scope description
  - Acceptance criteria
  - Deliverable
  - Project exclusion
  - Constraints
  - Assumptions
- One of the three major project documents:
  - Project charter
  - Project scope statement
  - Project management plan

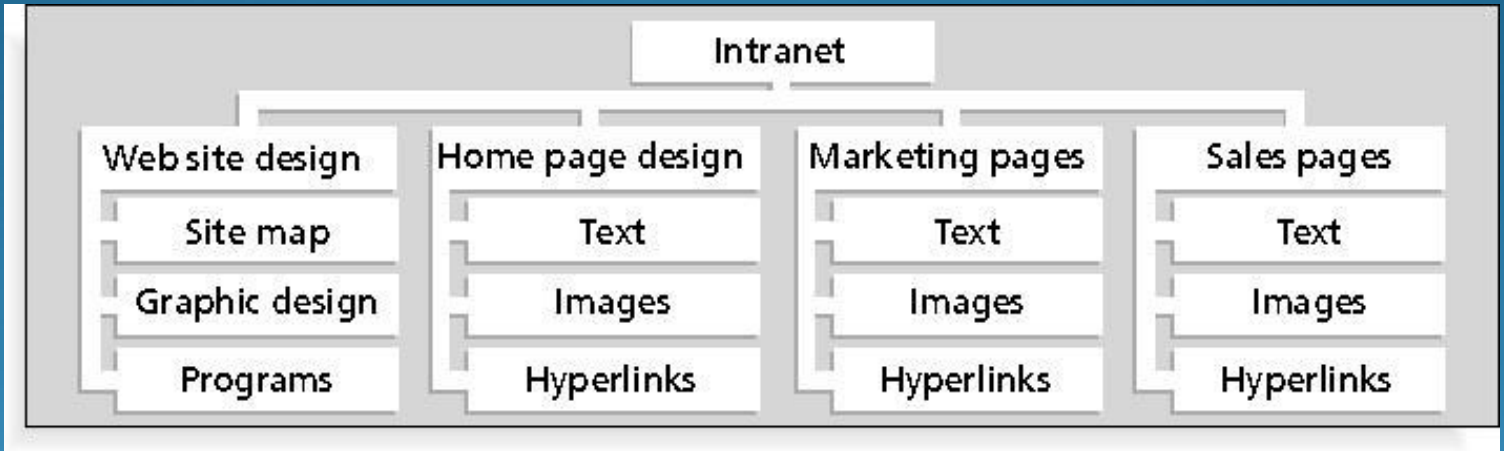
Creating the Work Breakdown Structure (WBS)

- 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

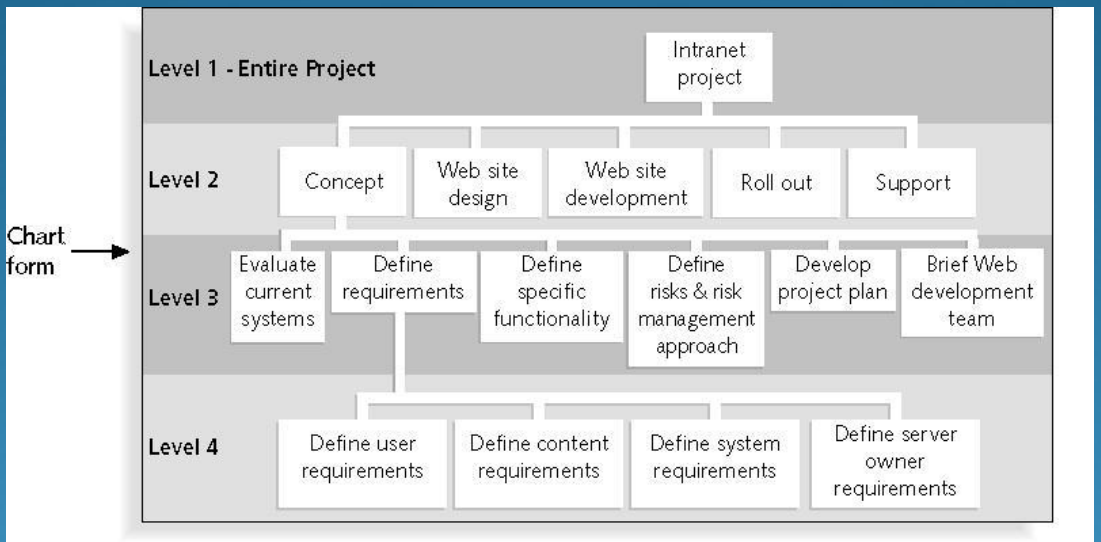


- Scope baseline:
  - Approved Project Scope statement, WBS, and WBS dictionary together form the Scope Baseline
  - WBS Dictionary – detailed content of the components contained in WBS, Work packages and Control accounts
  - WBS – hierarchical decomposition of the total scope of work

Sample Intranet WBS Organized by Product



Sample Intranet WBS Organized by Phase



Tabular form with Microsoft Project numbering

1.0 Concept
- 1.1 Evaluate current systems
- 1.2 Define requirements
  - 1.2.1 Define user requirements
  - 1.2.2 Define content requirements
  - 1.2.3 Define system requirements
  - 1.2.4 Define server owner requirements
- 1.3 Define specific functionality
- 1.4 Define risks and risk management approach
- 1.5 Develop project plan
- 1.6 Brief Web development team

2.0 Web site design
3.0 Web site development
4.0 Roll out
5.0 Support

Tabular form with PMI numbering

1.1 Concept
- 1.1.1 Evaluate current systems
- 1.1.2 Define requirements
  - 1.1.2.1 Define user requirements
  - 1.1.2.2 Define content requirements
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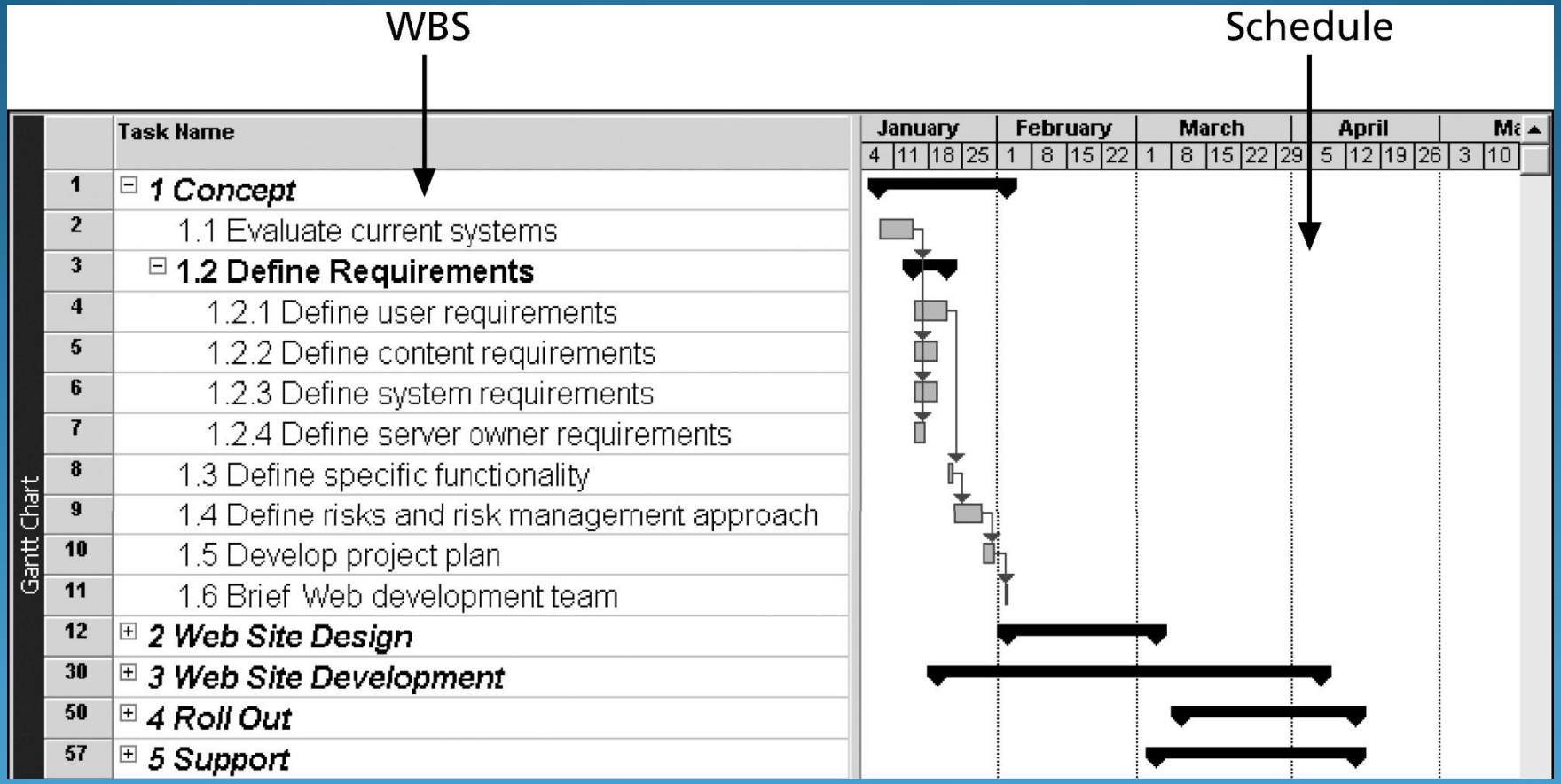
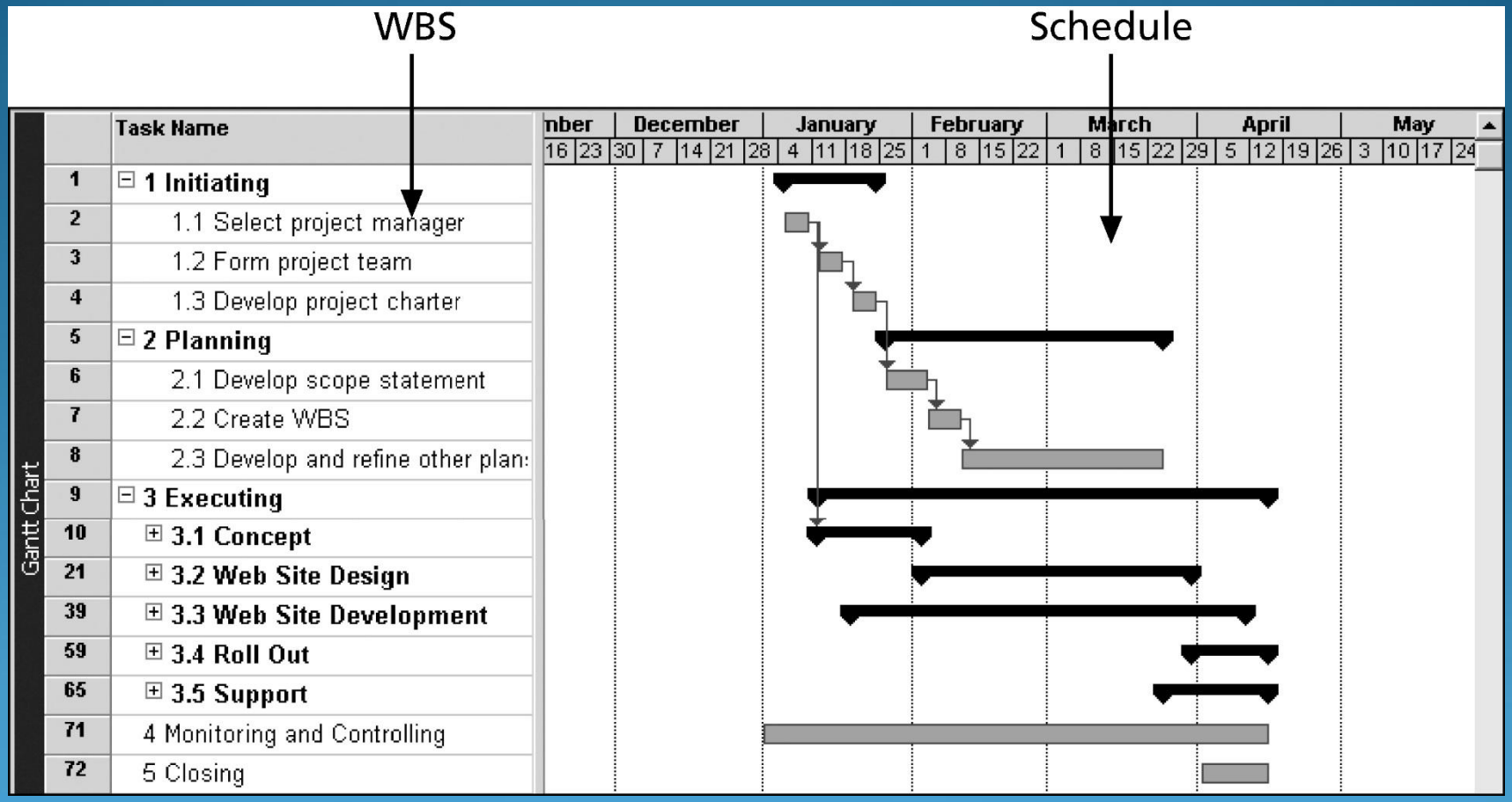
1.2 Web site design
1.3 Web site development
1.4 Roll out
1.5 Support

Intranet WBS and Gantt Chart in Microsoft Project



Intranet Gantt Chart Organized by Project Management Process Groups



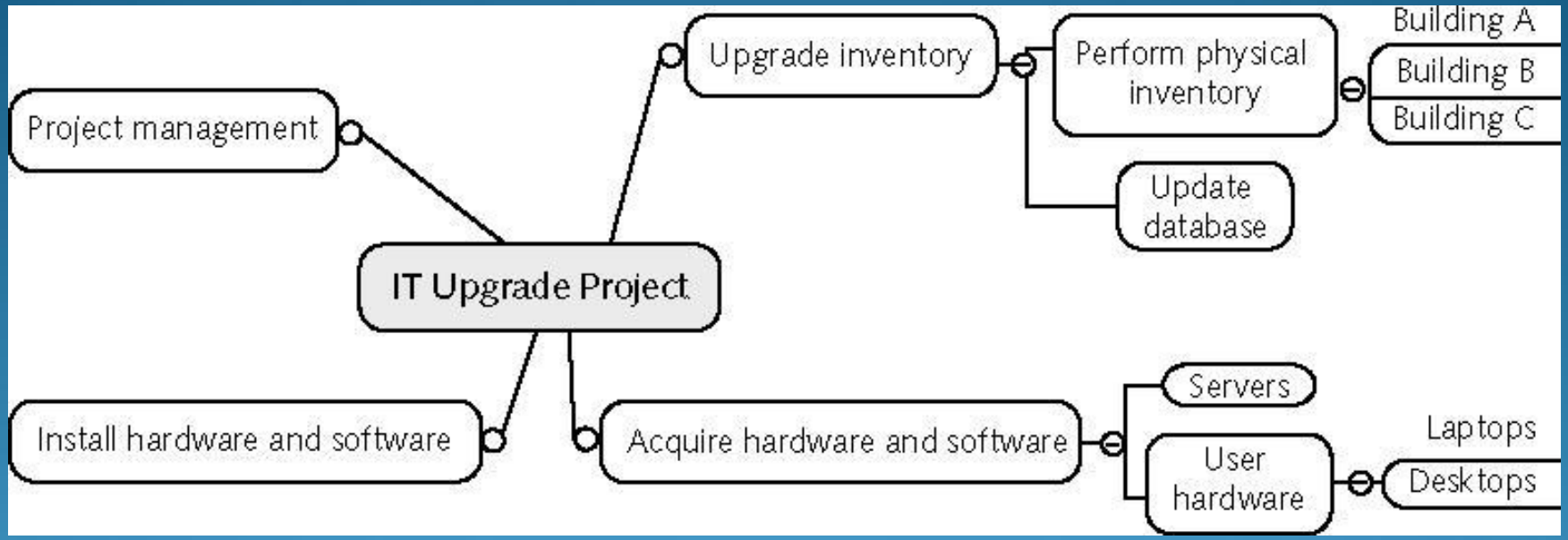
WBS and WBS Dictionary

- Enables team to conduct a detailed planning and documentation
- Assist team for all kinds of estimations
- Each item in the WBS will be assigned a unique identifier called code of accounts
- A unit of work should appear at only one place in 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
- The WBS must be consistent with the way in which work is actually going to be performed
- Project team should be involved in developing WBS to ensure consistency and buy-in
- Each WBS item must be documented in a WBS dictionary
- The WBS must be flexible to accommodate inevitable changes while maintaining control
- Planning Packages are located between work packages and control accounts
- WBS is a good communication tool

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
- The bottom-up approach
- 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



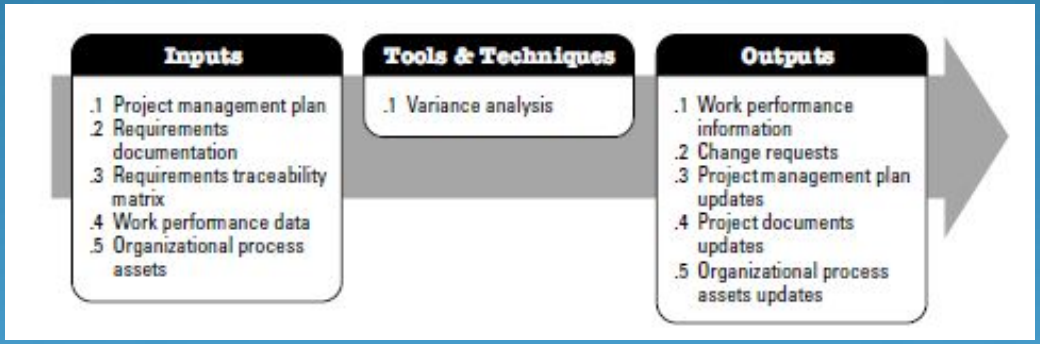
Validate Scope

- 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

- Quality control is generally performed before Scope Verification, but these two processes can be performed in parallel
- Scope verification: Focuses on acceptance of work results
- Quality control: Focuses on correctness/meeting quality guidelines of work results

Control 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

- Keep the scope realistic. Break large projects down into a series of smaller ones
- Involve users in project scope management
- Use off-the-shelf hardware and software whenever possible
- Follow good project management 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 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

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:
  - Plan scope management
  - Collect requirements
  - Define scope
  - Create WBS
  - Validate scope
  - Control scope