Session 4:
Project Scope Management

Learning Objectives

- List key reasons why good project scope management is important
- 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
- Explain the importance of validating scope and how it relates to defining and controlling scope

Learning Objectives

- Given an information technology (IT) project situation, show how recommended approaches for controlling scope can improve the potential for project success
- Describe how software can assist in project scope management
- Discuss considerations for agile/adaptive environments

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
  - ***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 Main Processes

- ***Planning scope management***: 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

Planning Scope Management

- The project team uses expert judgment, data analysis, and meetings to develop two important outputs
  - *Scope management plan (subsidiary part of the project management plan)*
  - *Requirements management plan*
- Scope management plan describes how to:
  - *Prepare a detailed project scope statement*
  - *Create a WBS*
  - *Maintain and approve the WBS*
  - *Obtain formal acceptance of the completed project deliverables*
  - *Control requests for changes to the project scope*

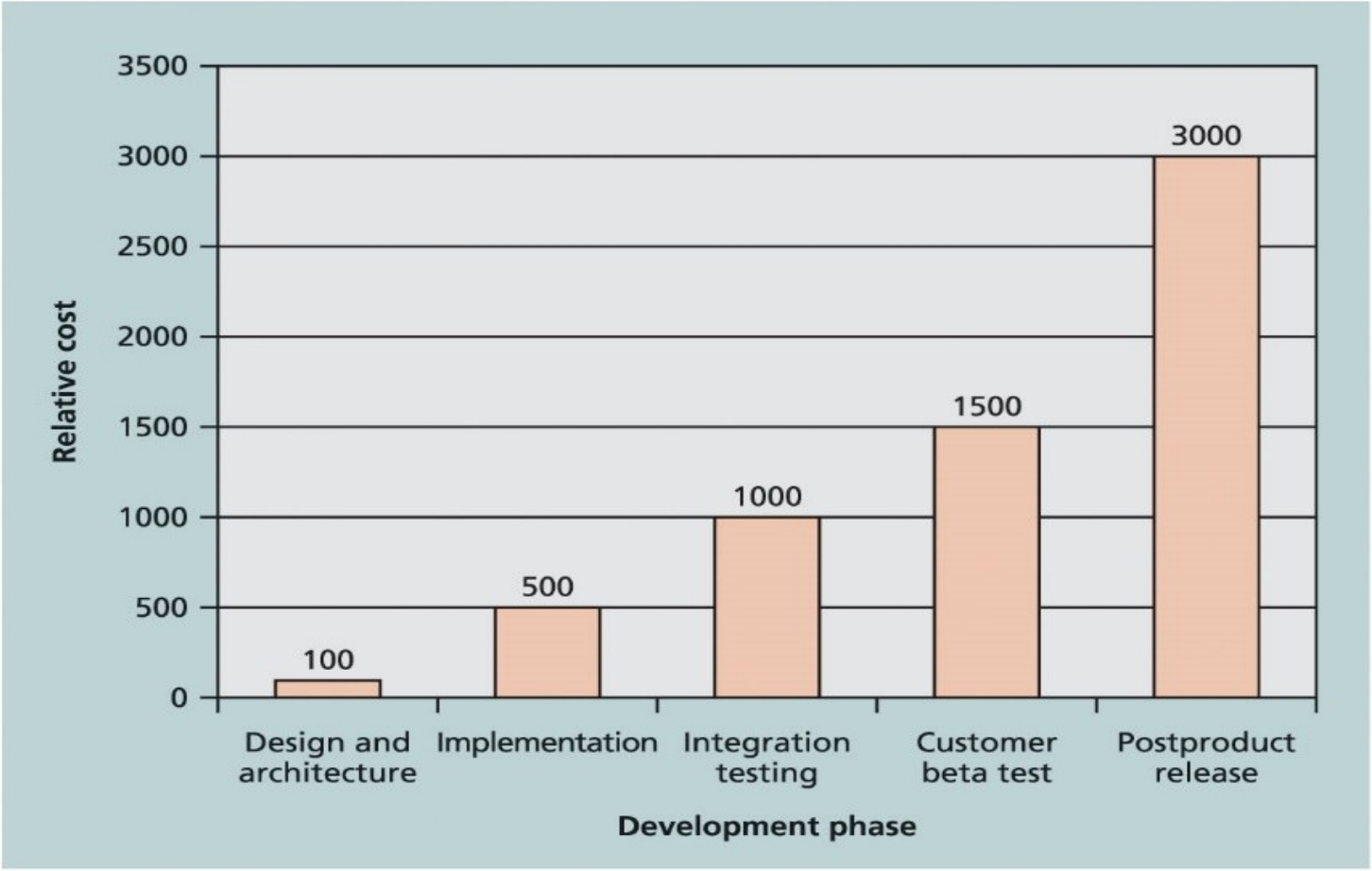
Planning Scope Management

- Requirements Management Plan
  - *The PMBOK® Guide, Sixth Edition, describes a requirement as a condition or capability that is necessary to be present in a product, service, or result to satisfy a business need”*
- The requirements management plan documents how project requirements will be analyzed, documented, and managed
  - *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*

Collecting Requirements

- Several ways to collect requirements
  - *Interviewing stakeholders*
  - *Holding focus groups and facilitated workshops*
  - *Using group creativity and decision-making techniques*
  - *Utilizing questionnaires and surveys*
  - *Conducting observation studies*
  - *Generating ideas by comparing specific project practices or product characteristics (i.e., benchmarking)*

Collecting Requirements



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

FIGURE 5-2 Relative cost to correct a software defect

Collecting Requirements

- Requirements traceability matrix (RTM): 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 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

- Important elements of a project scope statement
  - *Product scope description*
  - *Product user acceptance criteria*
  - *Detailed information on all project deliverables*
- It is also helpful to document other scope-related information
  - *Project boundaries, constraints, and assumptions*
  - *Supporting document references (e.g., product specifications)*
- As time progresses, the scope of a project should become more clear and specific

Creating the Work Breakdown Structure

- Work Breakdown Structure (WBS) is a deliverable-oriented grouping of the work involved in a project that defines the total scope of the project
  - *Foundation document that provides the basis for planning and managing project schedules, costs, resources, and changes*
- Decomposition is the main tool or technique for creating a WBS
  - *Subdividing project deliverables into smaller pieces*
  - *A work package is a task at the lowest level of the WBS*
- Outputs of creating the WBS are the scope baseline and project documents updates
  - *Scope baseline includes the approved project scope statement and its associated WBS and WBS dictionary*

Creating the Work Breakdown Structure

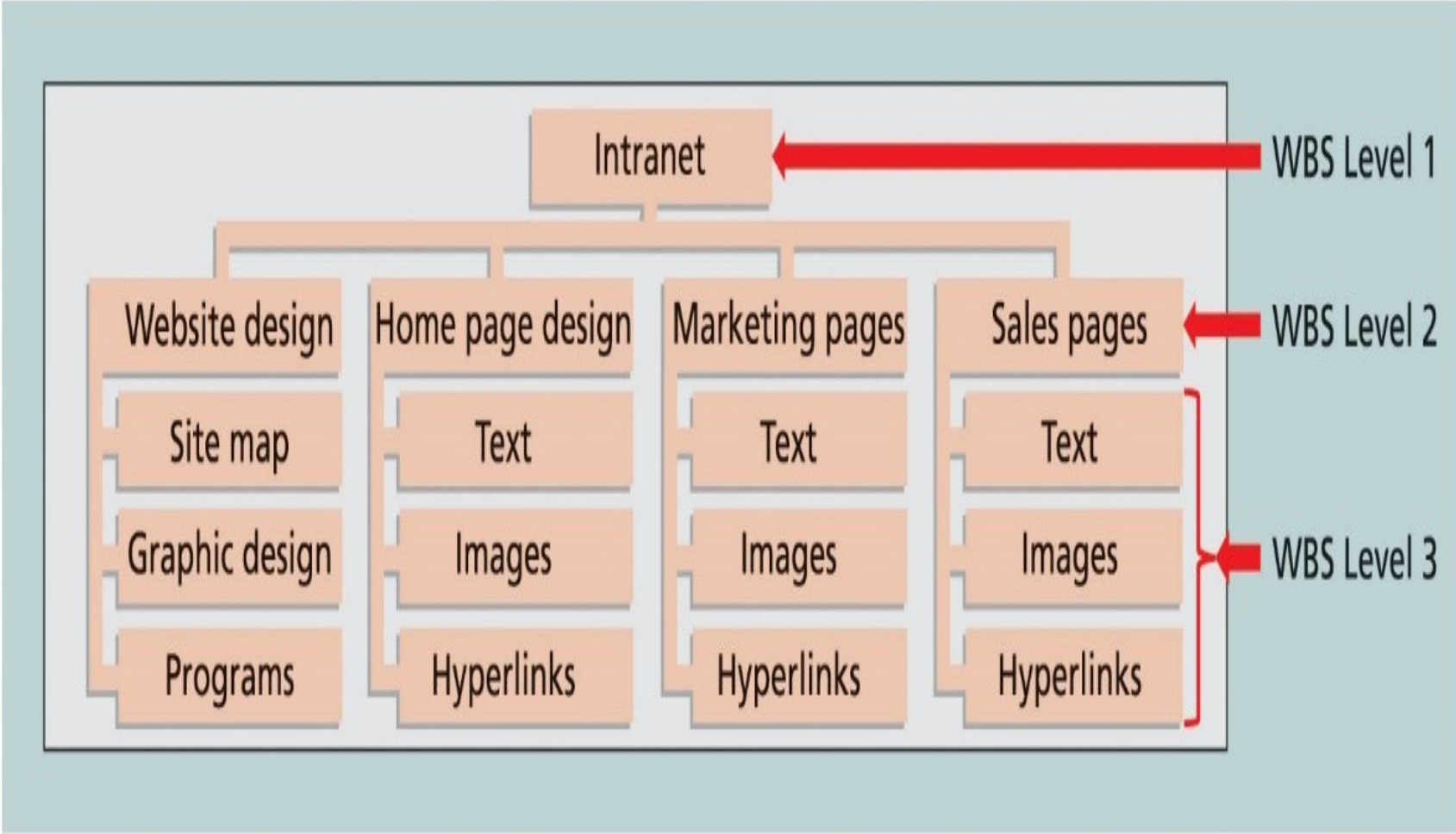


FIGURE 5-3 Sample intranet WBS organized by product

Creating the Work Breakdown Structure

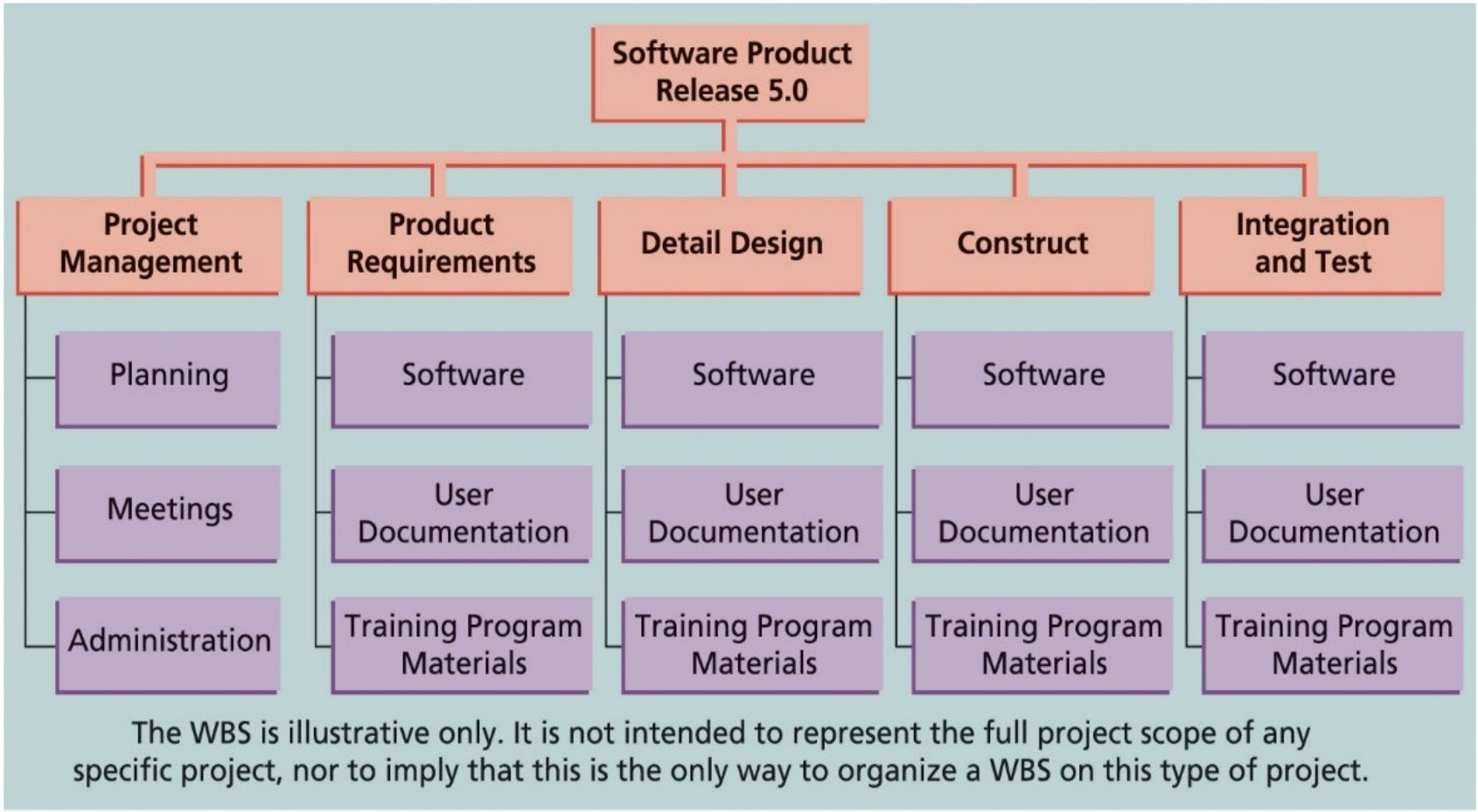


FIGURE 5-4 Sample intranet WBS organized by phase in chart and tabular form

Creating the Work Breakdown Structure

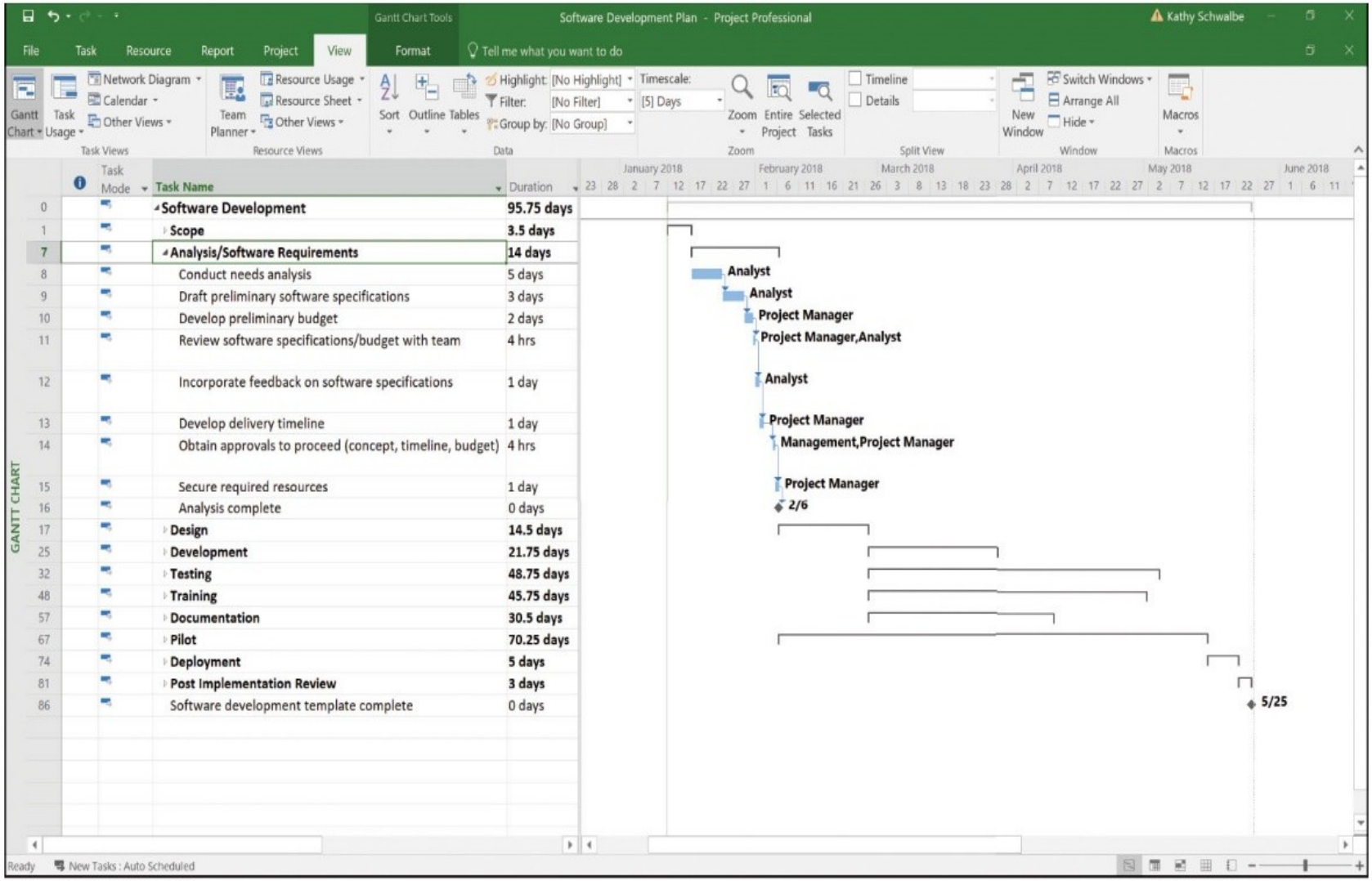


FIGURE 5-5 Software development project template from Microsoft Project 2016

Creating the Work Breakdown Structure

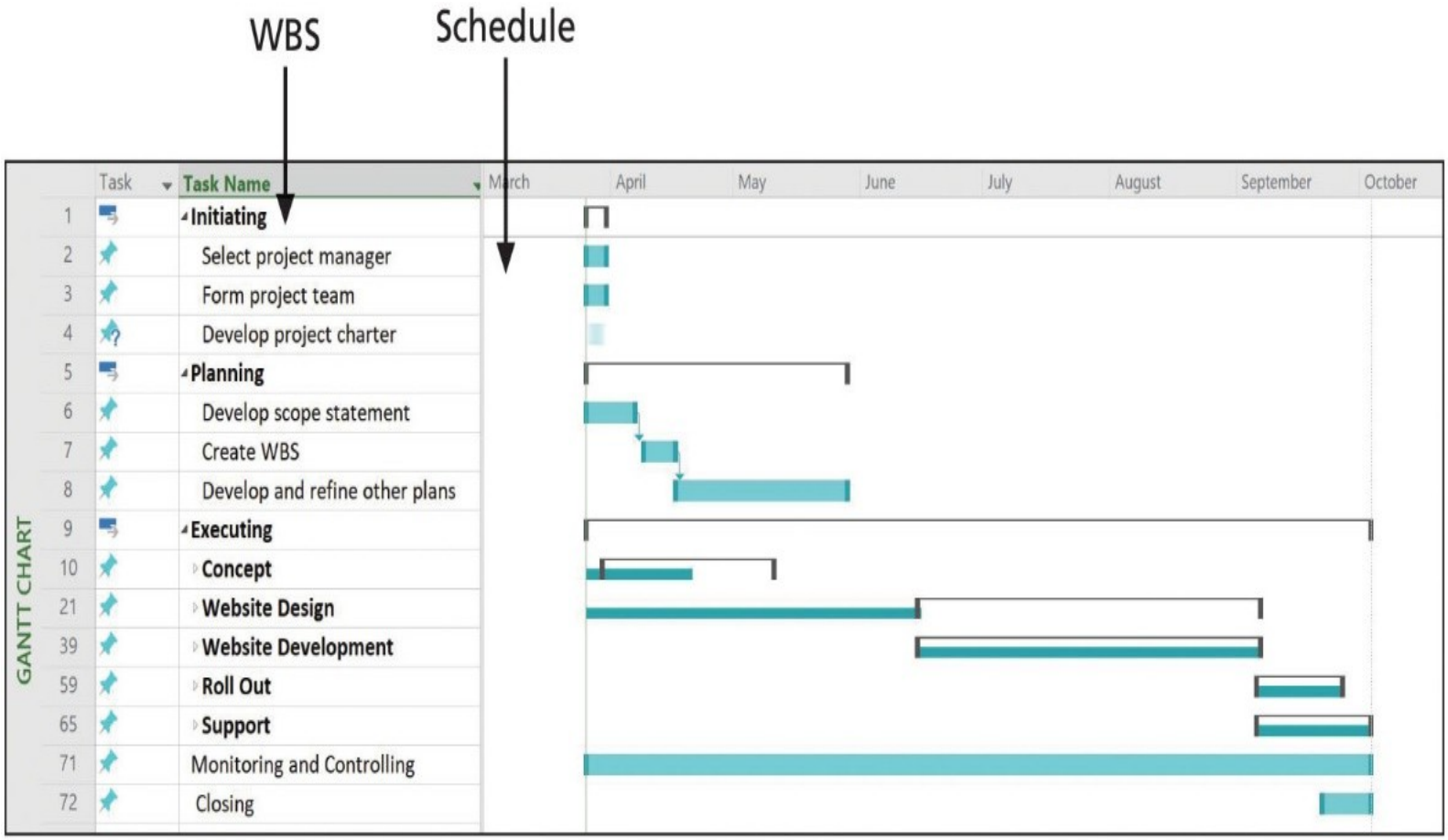


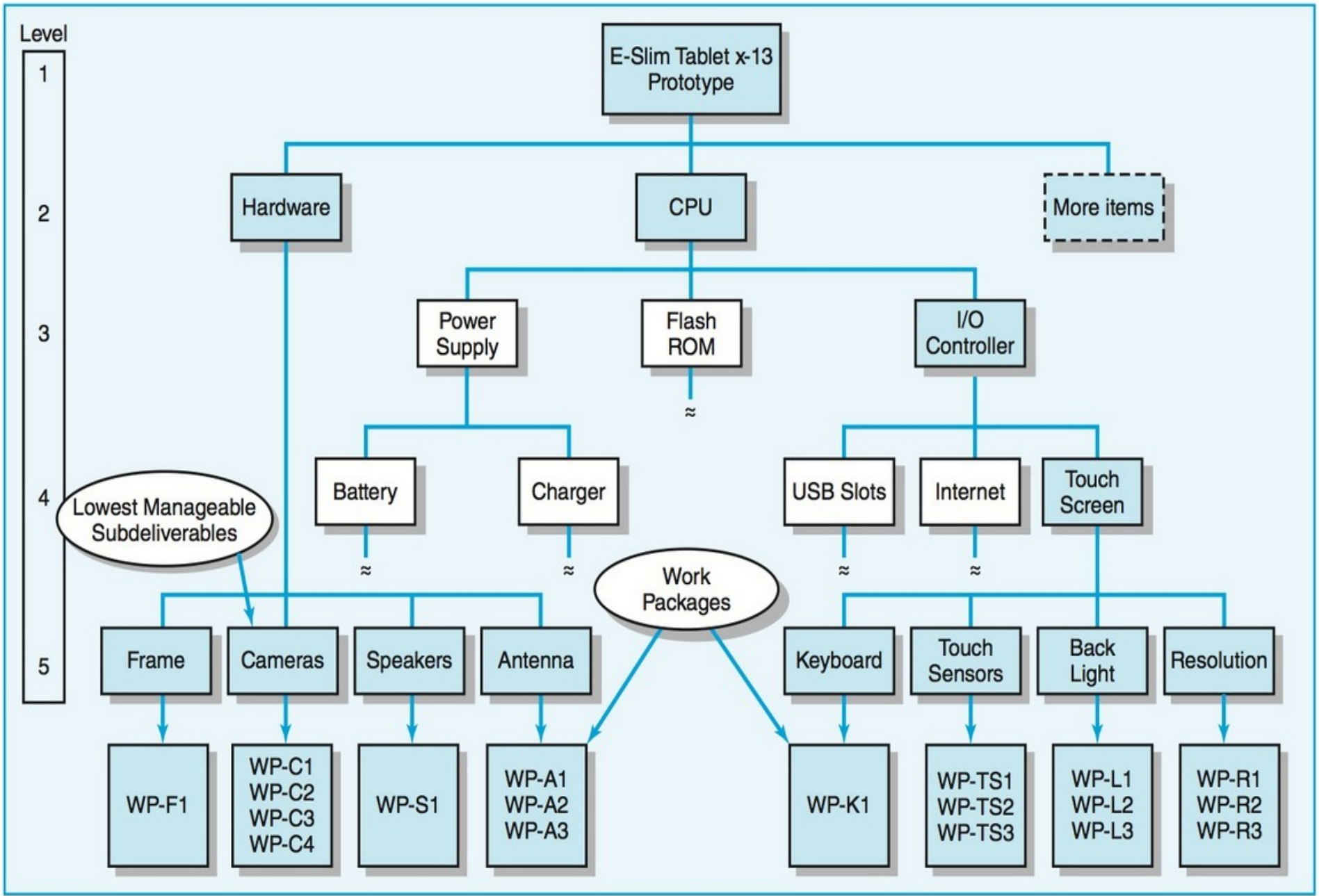
FIGURE 5-6 Website project Gantt chart organized by project management process groups

Creating the Work Breakdown Structure

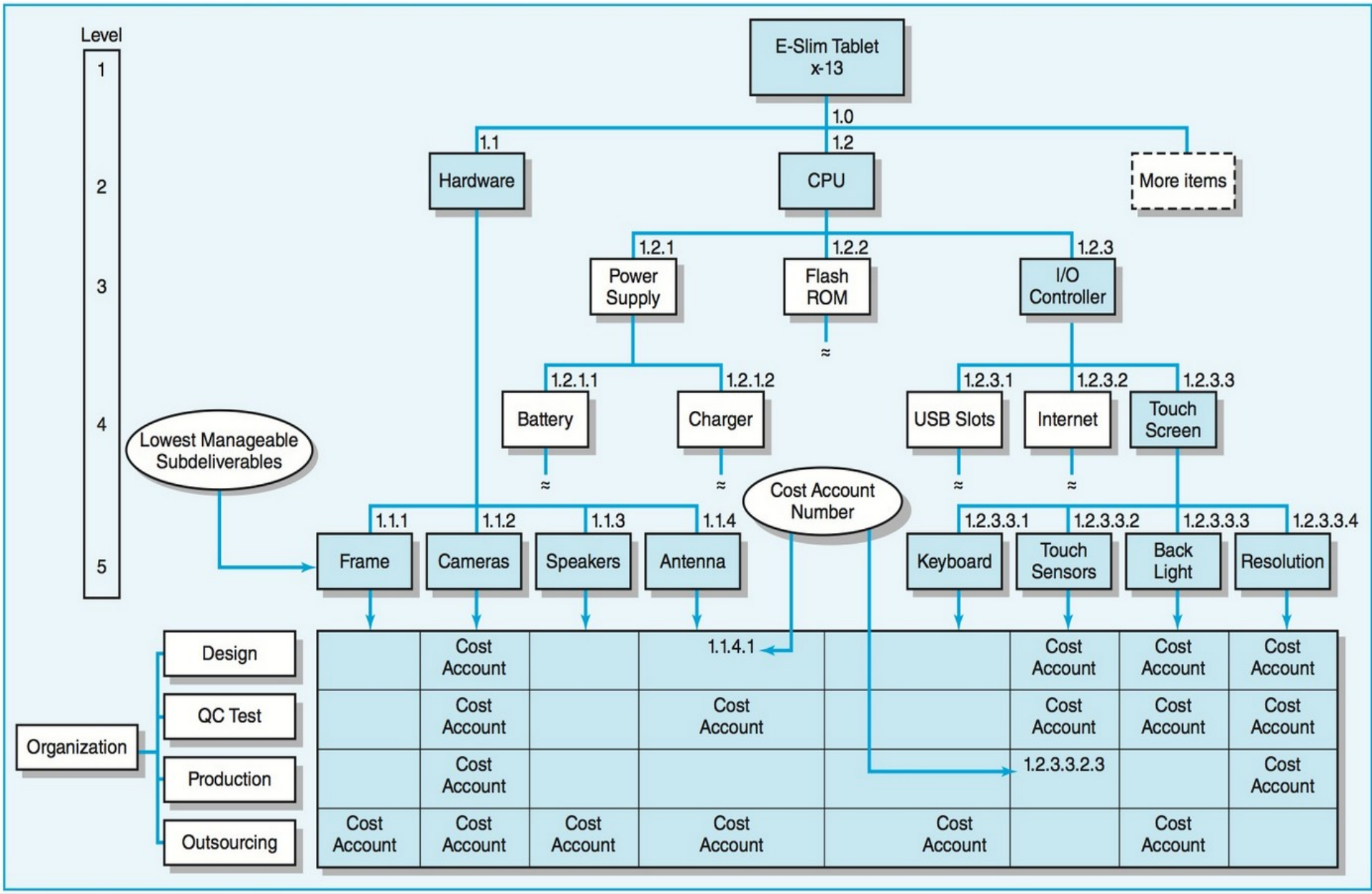
1.0 Software Product Release 5.0		
	1.1 Project Management	
		1.1.1 Planning
		1.1.2 Meetings
		1.1.3 Administration
	1.2 Product Requirements	
		1.2.1 Software
		1.2.2 User Documentation
		1.2.3 Training Program Materials
	1.3 Detail Design	
		1.3.1 Software
		1.3.2 User Documentation
		1.3.2 User Documentation
	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

Table 5-4 Tabular form of WBS

Work Breakdown Structure



Integration of WBS and OBS



The WBS Dictionary

Many WBS tasks are vague

- WBS dictionary is a document that describes detailed information about each WBS item
  - *Format of the WBS dictionary can vary based on project needs*

Sample WBS Dictionary

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 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, Physical Inventory, and must precede WBS Item Number 3.0, Hardware and Software Acquisition.

Advice for creating WBS & Dictionary

- Unit of work should appear at only one place in the WBS
- Work content of a WBS item is the sum of the WBS items below it
- WBS item is the responsibility of only one individual, even though many people may be working on it
- 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
- 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

Validating Scope

- It is difficult to create a good project scope statement and WBS for a project
  - *Even more difficult, especially on IT projects, to verify the project scope and minimize scope changes*
- Even when the project scope is fairly well defined, many IT projects suffer from scope creep
  - *Tendency for project scope to keep getting bigger and bigger by unapproved work*
- 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*

Controlling Scope

- Scope control involves controlling changes to the project scope
  - *Keeping project goals and business strategy in mind*
- Goals of scope control
  - *Influence the factors that cause scope changes*
  - *Ensure 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

Controlling Scope

- Suggestions for improving user input
  - *Develop a good project selection process and insist that sponsors are from the user organization*
  - *Place users on the project team*
  - *Conduct regular meetings with defined agendas*
  - *Deliver something to users and sponsors on a regular basis*
  - *Do not promise to deliver what the team cannot deliver in a particular time frame*
  - *Locate users with the developers*

Controlling Scope

- Suggestions for reducing incomplete and changing requirements
  - *Develop and follow a requirements management process*
  - *Employ 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 it 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*

Considerations for Agile/Adaptive Environments

- Stakeholders define and approve the detailed scope before the start of an iteration with an adaptive or agile product life cycle, producing a usable product at the end of each iteration
  - *Detailed scope develops over time*
- Agile approach provides several usable products during the project

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