Chapter 3

Project Scope Management

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3.1 What is Project Scope Management?

Elements of project scope management :

+ User involvement
+ Clear business
+ Objectives, and
+ Optimised scope

Important and difficult aspect of project management

Defining the scope of a project

- Scope refers to all the work involved in creating the products of the project and the processes used to create them.
- Project scope management includes the processes involved in defining and controlling what work 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.

Six main processes are involved in project scope management:

1. Planning scope management involves determining how the projects scope and requirements will be managed.
2. Collecting requirements involves defining and documenting the features and functions of the products as well as the processes used for creating them.
3. Defining scope involves reviewing the scope management plan, project charter, requirements documents, and organisational process assets to create a scope statement, adding more information as requirements are developed and change requests are approved.

4. Creating the WBS (Work Breakdown Structure) involves subdividing the major project deliverables into smaller, more manageable components.
5. Validating scope involves formalising acceptance of the project deliverables. Key project stakeholders, such as the customer and sponsor for the project, inspect and then formally accept the deliverables during this process. If the deliverables are not acceptable, the customer or sponsor usually requests changes.

6. Controlling scope involves controlling changes to project scope throughout the life of the project—a challenge on many IT projects. Scope changes often influence the team' ability to meet project time and cost goals, so project managers must carefully weigh the costs and benefits of scope changes.

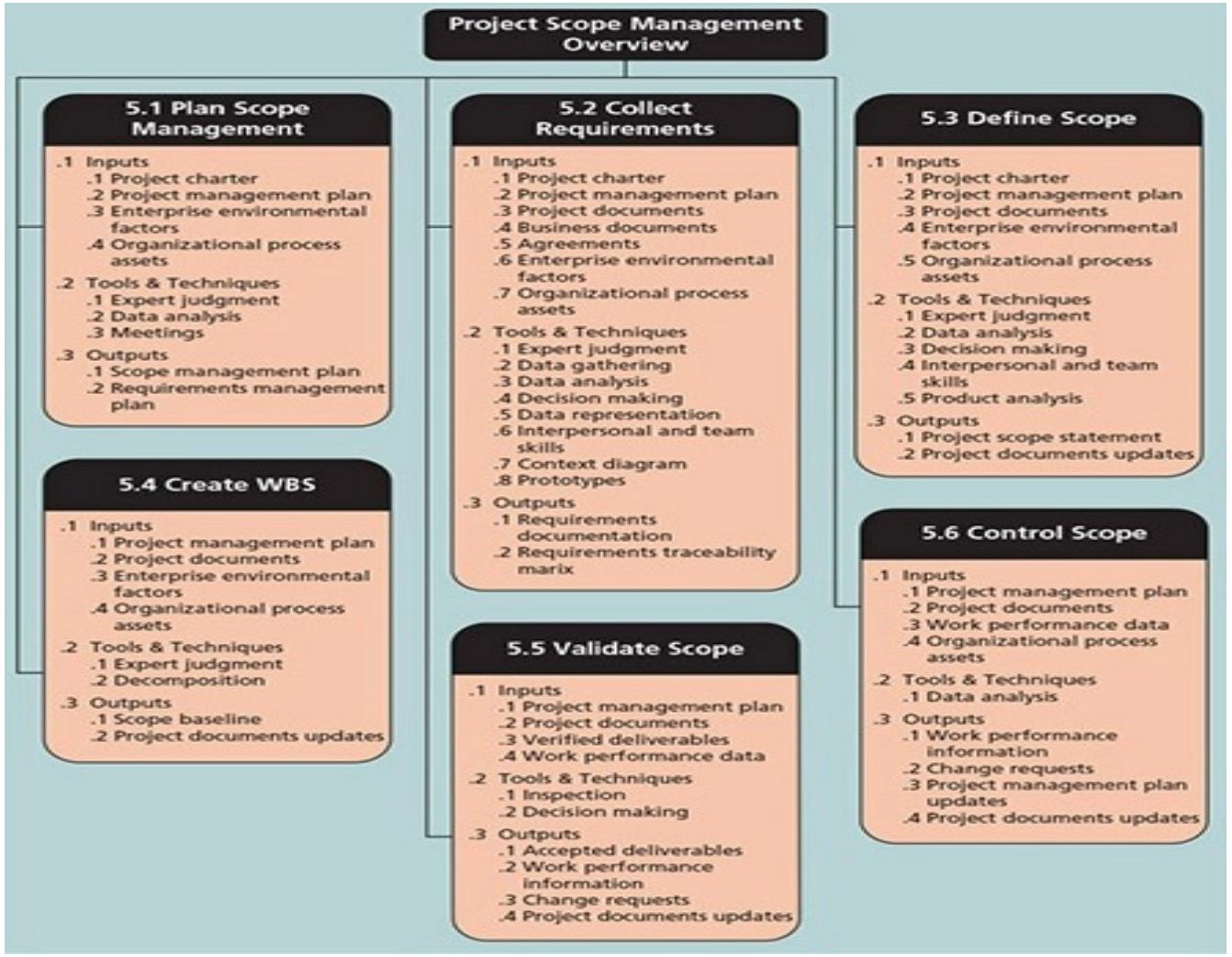


Figure 3.1 Project scope overview

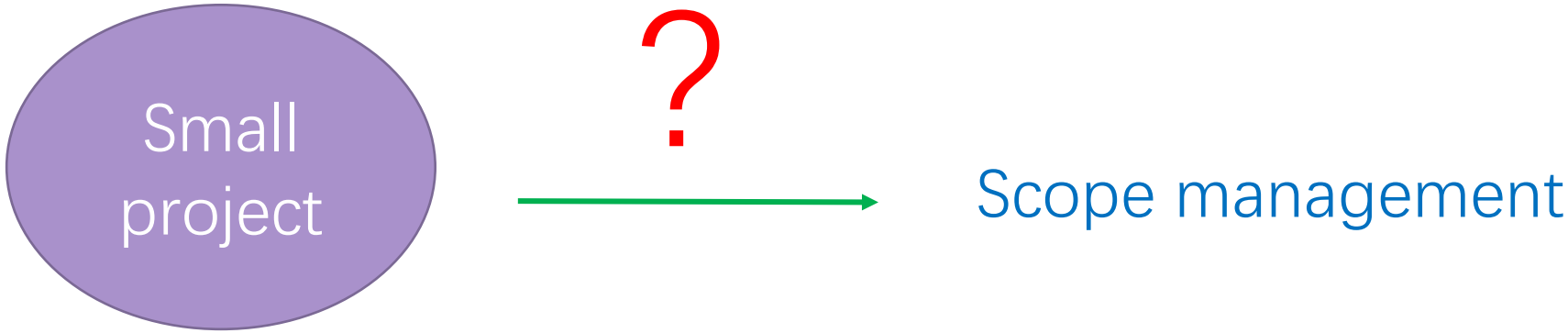
3.2 Planning Scope Management

The first step in project scope management is planning how the scope will be managed throughout the life of the project.

After reviewing:
- The project management plan
- Project charter
- Enterprise environmental factors, and
- Organisational process assets

The project team uses expert judgment & data analysis

The scope management plan and the requirements management plan


Small project
?
Scope management

- In general, a scope management plan includes the following information:
- How to prepare a detailed project scope statement: For example, are there templates or guidelines to follow? How much detail is needed to describe each deliverable?
- How to create a WBS: It is often difficult to create a good WBS. This section of the scope management plan would provide suggestions, samples, and resources for creating a WBS.

- How to maintain and approve the WBS: The initial WBS often changes, and project team members disagree on what should be included. The scope management plan describes guidelines for maintaining the WBS and getting approval for it.
- How to obtain formal acceptance of the completed project deliverables: It is extremely important to understand the process for obtaining formal acceptance of completed deliverables, especially for projects in which payments are based on formal acceptance.

- How to control requests for changes to the project scope: This process is related to performing integrated change control. Organisations often have guidelines for submitting, evaluating, and approving changes to scope, and this section of the scope management plan would specify how to handle chang requests for the project.

Another important output of planning scope management is the requirements management plan.

Before that, it is important to understand what requirements are. The 1990 IEEE Standard Glossary of Software Engineering Terminology defines a requirement as follows:

1. A condition or capability needed by a user to solve a problem or achieve an objective.
2. A condition or capability that must be met or possessed by a system or system component to satisfy a contract, standard, specification, or other formally imposed document.
3. A documented representation of a condition or capability as in 1 or 2.

- The PMBOK® Guide – Sixth Edition, defines a requirement as “a condition or capability that is necessary to be present in a product, service, or result to satisfy a business need.”
- It further explains that requirements "include the quantified and documented needs and expectations of the sponsor, customer, and other stakeholders ⟶ need to be elicited, analysed, and recorded in enough detail.

For example, the chapter’ s opening case describes a project for upgrading IT assets to meet corporate standards. These standards specify the minimum requirements for each laptop, such as the type of processor, amount of memory, and hard disk size. The documented requirements for this project, therefore, might state that all laptops include a specific type of processor, a minimum amount of memory, and a minimum hard drive size.

- For software projects, it is helpful to divide requirements development into the software engineering steps called elicitation, analysis, specification, and validation. These steps include all the activities involved in gathering, evaluating, and documenting requirements for a software or software-containing product. It is also important to use an iterative approach to defining requirements because they are often unclear early in a project.

+ The requirements management plan documents how project requirements will be analysed, 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

What went right?

- Several studies cite how difficult it is to manage requirements. Finding qualified people —business analysts—to do the job is equally difficult. The U.S. Bureau of Labour Statistics has projected the number of jobs for business analysts to increase 19 percent by 2022.
- A PMI survey found that only 49 percent of respondents had the resources in place to do requirements management properly and 53 percent failed to use a formal process to validate requirements.

3.3 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.

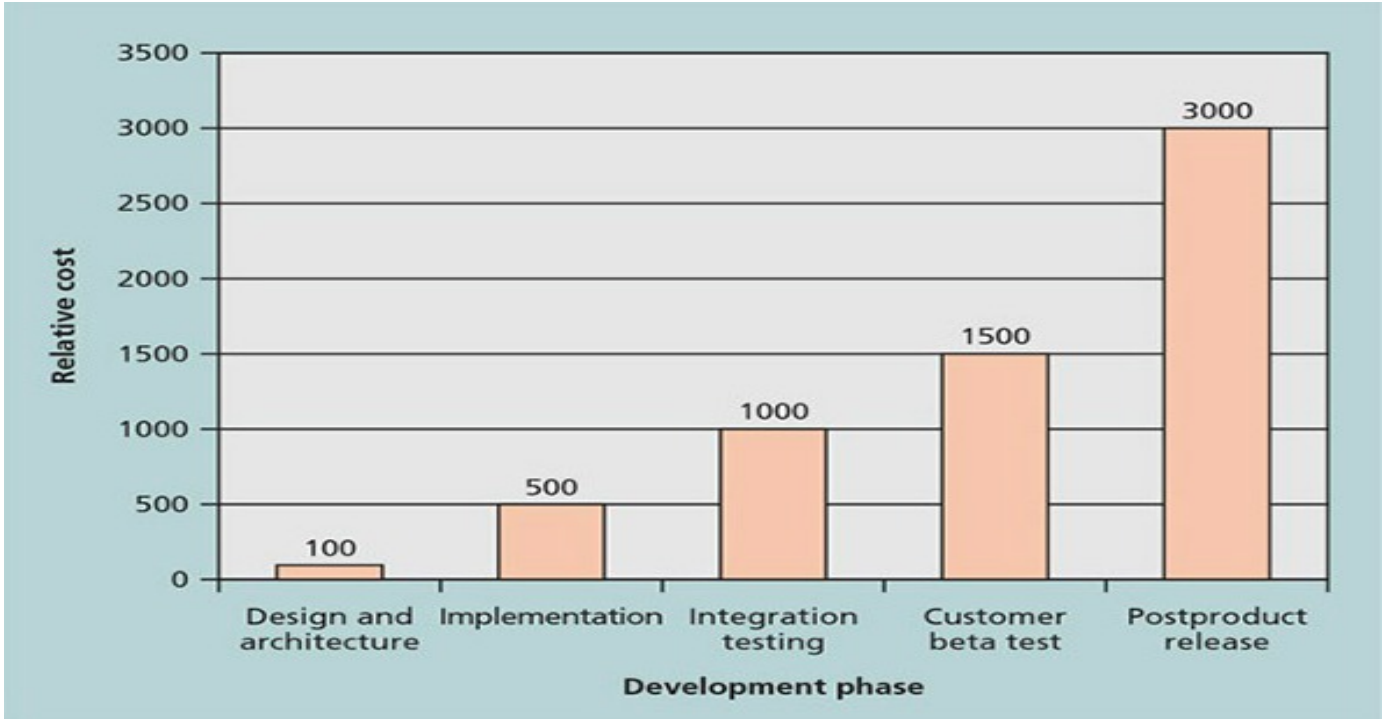


Figure 3.2 Relative cost to correct a software defect

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

3.4 Defining Scope

- The next step in project scope management is to provide a detailed definition of the work required for the project.
- 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.

- The main tools and techniques used in defining scope include expert judgment, data analysis, decision making, interpersonal and team skills, and product analysis.
- The main outputs of scope definition are the project scope statement and project documents updates.

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.

Figure 3.4 Defining Project scope

3.5 Creating the Work Breakdown Structure

The next step in project scope management is to create a work breakdown structure.

A work breakdown structure (WBS) is a deliverable-oriented grouping of the work involved in a project that defines its total scope.

- Because most projects involve many people and many different deliverables, it is important to organize and divide the work into logical parts based on how the work will be performed.
- The WBS is a foundation document in project management because it provides the basis for planning and managing project schedules, costs, resources, and changes.

- The project management plan, project documents, enterprise environmental factors, and organisational process assets are the primary inputs for creating a WBS.
- The main tool or technique is decomposition —that is, subdividing project deliverables into smaller pieces.
- The outputs of the process of creating the WBS are the scope baseline and project documents updates. The scope baseline includes the approved project scope statement and its associated WBS and WBS dictionary.

What does a WBS look like?

A WBS is often depicted as a task-oriented tree of activities, similar to an organisational chart.

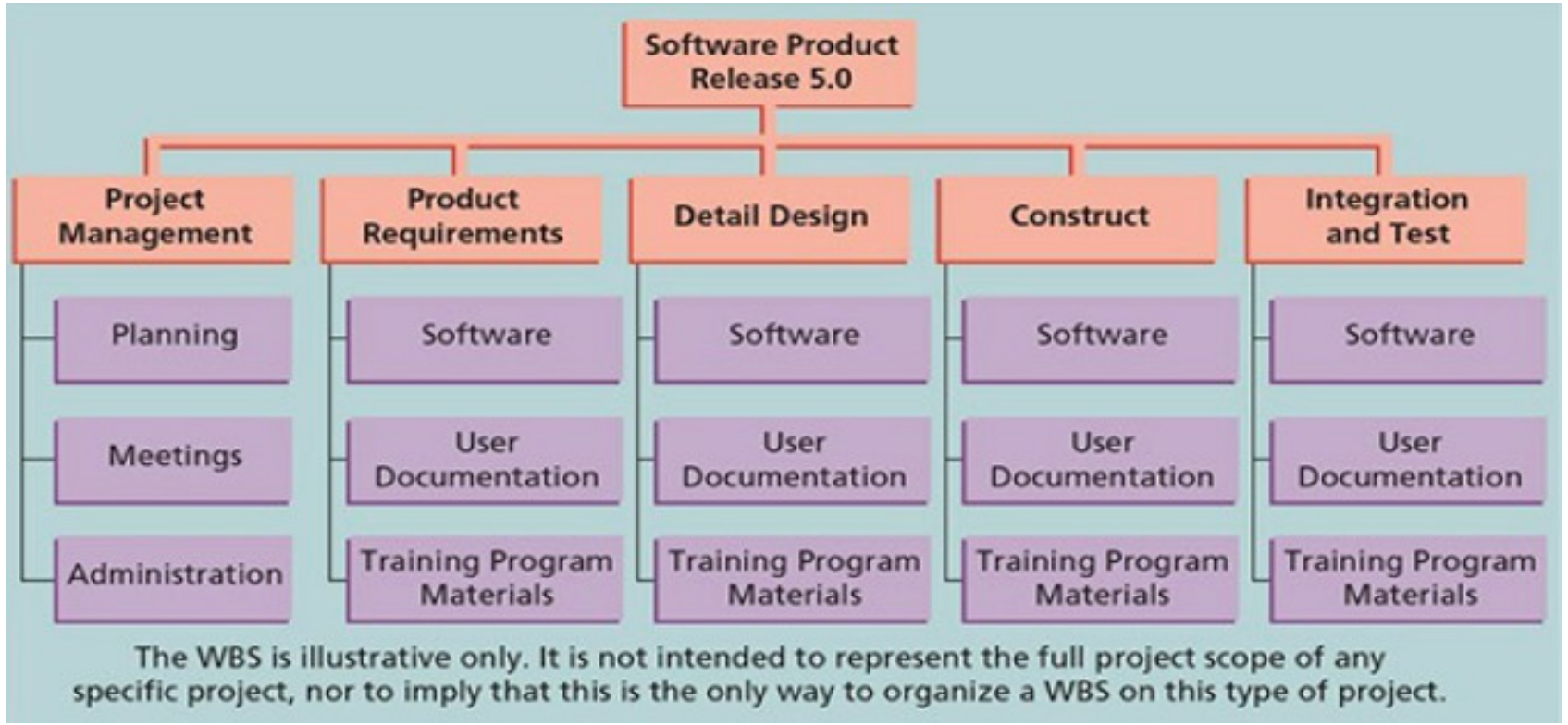


Figure 3.5 Sample intranet WBS organized by phase in chart and tabular form

Table 3.1 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

3.6 Validating Scope

- It is difficult to create a good project scope statement and WBS for a project. It is even more difficult, especially on IT projects, to verify the project scope and minimise scope changes.
- In this case, the project team must develop a process for scope validation that meets unique project needs. Careful procedures must be developed to ensure that customers are getting what they want and that the project team has enough time and money to produce the desired products and services.

- It is very important to verify the project scope with users throughout the life of the project and develop a process for controlling scope changes.
- Scope validation involves formal acceptance of the completed project deliverables. This acceptance is often achieved by a customer inspection and then sign-off on key deliverables.
- To receive formal acceptance of the project scope, the project team must develop clear documentation of the project’ s products and procedures to evaluate whether they were completed correctly and satisfactorily.

- The project management plan, project documents, verified deliverables, and work performance data are the main inputs for scope validation.
- The main tools for performing scope validation are inspection and decision-making techniques.

3.7 Controlling Scope

- Scope control involves managing changes to the project scope while keeping project goals and business strategy in mind.
- The goal of scope control is to influence the factors that cause scope changes, to ensure that changes are processed according to procedures developed as part of integrated change control, and to manage changes when they occur.
- 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.

- The project management plan, project documents, work performance data, and organisational process assets are the main inputs to scope control.
- An important tool for performing scope control is data analysis, including variance analysis.

- Variance is the difference between planned and actual performance.
- For example, if a supplier was supposed to deliver five special keyboards and you received only four, the variance would be one keyboard.
- The outputs of scope control include work performance information, change requests, project management plan updates, and project documents updates.

- 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.