PROJECT SCOPE MANAGEMENT
What does the scope knowledge area do?

- It includes the processes required to ensure that the project includes all the work required and only the work required to complete the project successfully.
- Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project.
- Project Scope Management defines and controls all the work included and not included in the plan.
- It makes sure that everyone agrees with the scope.
PROJECT SCOPE MANAGEMENT

Project Scope Management includes the following processes:

- Collect Requirements
- Define Scope
- Create WBS
- Verify Scope
- Control Scope
In the project context, the term scope can refer to:

**Product Scope**
- Features & functions that characterize a product, service or result, and/or

**Project Scope**
- Work that needs to be accomplished to deliver a product, service or result with the specified features and functions.

The processes used to manage project scope, as well as the supporting tools and techniques, vary by application area and are usually defined as part of the project life cycle.

**Scope baseline includes 3 things:**
- Approved Detailed Project Scope statement
- Associated work breakdown structure
- WBS dictionary
5.1 Collect Requirements

- Collect Requirements is the process of defining and documenting stakeholders’ needs to meet the project objectives.
- The project’s success is directly influenced by the care taken in capturing and managing project and product requirements.
- Requirements include the quantified and documented needs and expectations of the sponsor, customer, and other stakeholders.
- The requirements need to be elicited, analyzed, and recorded in enough detail to be measured once project execution begins.
- Collecting requirements is defining and managing customer expectations.
- Requirements become the foundation of the WBS.
- Cost, schedule, and quality planning are all built upon these requirements.
- The development of requirements begins with an analysis of the information contained in the project charter and stakeholder register.
SCOPE PROCESSES

5.2 Define Scope
- It is the process of developing a detailed description of the project and product.

5.3 Create WBS
- Subdivide major project deliverables into smaller, more manageable components

5.4 Verify Scope
- Formal acceptance of completed project deliverables, i.e. a signed document

5.5 Control Scope
- Control changes to the project scope
# SCOPE PROCESSES

## Process by process group

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COLLECT REQUIREMENTS

WHAT HAPPENS IN COLLECT REQUIREMENTS?

The development of requirements begins with an analysis of the information contained in the project charter and stakeholder register.

The requirements are elicited, analyzed, and recorded in enough detail to be measured once project execution begins.
COLLECT REQUIREMENTS

**TOOLS & TECHNIQUES**
- Interviews
- Focus groups
- Facilitated workshops
- Group creativity techniques
- Group decision making techniques
- Questionnaires and surveys
- Observations
- Prototypes

**INPUTS**
- Project charter
- Stakeholder register

**OUTPUTS**
- Requirements documentation
- Requirements Management Plan
- Requirements traceability matrix
COLLECT REQUIREMENTS - INPUTS

INPUTS

1. Project Charter

2. Stakeholder Register

It is used to identify stakeholders that can provide information on detailed project and product requirements (Stakeholder register is described in Sec 10.1)
COLLECT REQUIREMENTS - T&T

Tools & Techniques

1. Expert judgment
2. Templates, forms, standards
   - Could include, but not limited to, WBS templates, Scope Management Plan templates & project scope change control forms
COLLECT REQUIREMENTS – T&T
TOOLS & TECHNIQUES

1. Interviews

2. Focus groups
   Focus groups bring together prequalified stakeholders and subject matter experts to learn about their expectations and attitudes about a proposed product, service, or result. A trained moderator guides the group through an interactive discussion, designed to be more conversational than one-on-one interview.

3. Facilitated Workshops

4. Group Creativity Techniques
   - Brainstorming
   - Nominal group technique
   - The Delhi Technique
   - Idea/mind mapping
   - Affinity diagram
COLLECT REQUIREMENTS – T&T

TOOLS & TECHNIQUES

5. Group Decision Making Techniques
   - Unanimity
   - Majority
   - Plurality (the largest block in a group)
   - Dictatorship

6. Questionnaires and Surveys

7. Observations

8. Prototypes

Prototyping is a method of obtaining early feedback on requirements by providing a working model of the expected product before actually building it.
COLLECT REQUIREMENTS - OUTPUTS

OUTPUTS

- Requirements Documentation
  (Read Sec. 5.1.3.1, page 109 of PMBOK Guide)

- Requirements Management Plan
  (Read Sec. 5.1.3.2, page 110 of PMBOK Guide)
COLLECT REQUIREMENTS - OUTPUTS

OUTPUTS

• Requirements Traceability Matrix

  Traceability matrix is a table that links requirements to their origin and traces them throughout the project life cycle. It provides a structure for managing changes to the product scope. The process includes, but not limited to tracing:

  - Requirements to business needs, opportunities, goals, and objectives;
  - Requirements to project objectives;
  - Requirements to project scope/WBS deliverables;
  - Requirements to product design;
  - Requirements to product development;
  - Requirements to test strategy and test scenarios; and
  - High-level requirements to more detailed requirements
# SCOPE PROCESSES

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DEFINE SCOPE

What happens in Define Scope?

• Define Scope is the process of developing a detailed description of the project and product.

• The preparation of a detailed project scope statement is critical to project success and builds upon the major deliverables, assumptions, and constraints that are documented during project initiation.

• During planning, the project scope is defined and described with greater specificity as more information about the project is known.

• Existing risks, assumptions and constraints are analyzed for completeness
DEFINE SCOPE

**INPUTS**
- Project charter
- Requirements documentation
- Organizational process assets

**TOOLS & TECHNIQUES**
- Expert judgement
- Product analysis
- Alternatives identification
- Facilitated workshops

**OUTPUTS**
- Project scope statement
- Project document updates
DEFINE SCOPE - INPUTS

INPUTS

• Project Charter
  High-level project description and product characteristics

• Requirements documentation
  Described in Sec. 5.1.3.1 of PMBOK Guide

• Organizational process Assets
DEFINE SCOPE – T & T

TOOLS & TECHNIQUES

**Expert Judgment**

- Expert judgment is often used to analyze the information needed to develop the project scope statement.

**Product Analysis**

- Differs by application area (translates product objectives into tangible deliverables and requirements).
- Includes techniques such as product breakdown, systems analysis, systems engineering, value engineering, and value analysis.
**DEFINE SCOPE— T&T**

**Alternatives Identification**

- Technique used to generate different approaches to execute & perform project work.

- Common techniques are brainstorming (group shares impulse ideas & gains ideas from each other) & lateral thinking (consider several points of view)

**Facilitated Workshops**

- Read Section 5.1.2.3
1) Project Scope Statement

- It describes in detail the project deliverables & work required to create the deliverables.

- It defines what work will be performed & what work is excluded – determines how well the PM team can control the overall project scope – in turn can determine how well the PM team can plan, manage & control execution of the project

- It includes, either directly or by reference to other documents (must read page 115 of PMBOK thoroughly)
The detailed project scope statement includes, either directly, or by reference to other documents, the following:

• **Product scope description**
  
  Progressively elaborated characteristics of project's product, service or result described in the project charter and requirements documentation.

• **Product acceptance criteria**

  Process and criteria for accepting completed products

• **Project deliverables**

  Product or service of the project, and supplementary results, such as project management reports & documentation
DEFINE SCOPE - OUTPUTS

• Project exclusions
  Generally identifies what is excluded as from the project (must state explicitly)

• Project constraints
  - Restriction or limitation of the project scope that limit team’s option e.g. pre-defined budget; imposed dates or schedule milestones etc.
  - Projects performed under contract generally have contractual provisions

• Project assumptions
  - Factors, that for planning purposes, are considered true, real or certain. -
  - Generally involve a degree of risk
DEFINE SCOPE - OUTPUTS

2) Project Document Updates

Documents that may be updated include, but not limited to:

- Stakeholder register
- Requirements documentation
- Requirements traceability matrix
Question

My company is researching on “clean energy on clean transportation”. As the Project Manager, which of the following is a valid assumption?

A. Project scope is to develop an alternative energy source or electric drive for Off-road vehicles.
B. Project has to be completed in 24 months
C. Cost of the project is $17m
D. Gas will become a scarce commodity after 20 years
**DEFINE SCOPE - OUTPUTS**

**Answer: D**

Assumptions are factors that are considered *true, real or certain* (PM needs to make assumptions at every stage of the project)

Constraints are *limitations or restrictions*. (given in Project Charter)

**D is the only assumption; all the others are constraints.**
# SCOPE PROCESSES

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CREATE WBS

WHAT'S A WORK BREAKDOWN STRUCTURE?

• Deliverable-oriented hierarchy of decomposed work to be done by the project team.

• Organizes & defines the total scope of the project.

• Subdivides the project work into smaller, more manageable pieces of work.

(Refer to figure 5-7 in page117 of PMBOK)
CREATE WBS

**TOOLS & TECHNIQUES**
- Decomposition

**INPUTS**
- Project scope statement
- Requirements documentation
- Organizational process assets

**OUTPUTS**
- WBS
- WBS dictionary
- Scope baseline
- Project document updates
CREATE WBS - INPUTS

INPUTS

• Project Scope Statement
• Requirements Documentation
• Organizational Process Assets
Decomposition

- Decomposition is sub-division of project deliverables into smaller, more manageable components. Decomposition involves the following activities:

- Decomposition may not be possible for a deliverable or sub-project that will be accomplished far into the future.

- PM team waits until the deliverable or sub-project is clarified so the details of WBS can be developed. This technique is called “Rolling Wave Planning”.

(Read page 118)
CREATE WBS – Definitions

- **Work Package** – a deliverable at lowest level of WBS with a group of activities, which are used in Activity Definition as schedulable tasks (may be further decomposed)

- **Planning package** – Future deliverables or subprojects that can’t be decomposed
CREATE WBS

Decomposition process involves:

• Identifying the deliverables and related work
• Structuring and organizing the WBS
• Decomposing the upper WBS levels into lower level detailed components.
• Develop & Assign identification codes to each WBS component (code of account)
• Verifying that the degree of decomposition of the work is necessary and sufficient
APPROACHES TO DEVELOP WBS

• Using guidelines: Some organizations, like the DOD, provide guidelines for preparing WBSs

• The analogy approach: It often helps to review WBSs of similar projects

• The top-down approach: Start with the largest items of the project and keep breaking them down

• The bottoms-up approach: Start with the detailed tasks and roll them up
CREATE WBS

SAMPLE INTRANET WBS ORGANIZED BY PRODUCT
SAMPLE INTRANET WBS ORGANIZED BY PHASE

Level 0 - Entire Project
- Intranet Project

Level 1
- Concept
- Web Site Design
- Web Site Development
- Roll Out
- Support

Level 2
- Evaluate Current Systems
- Define Requirements
- Define Specific Functionality
- Define Risks & Risk Management Approach
- Develop Project Plan
- Brief Web Development Team

Level 3
- Define User Requirements
- Define Content Requirements
- Define System Requirements
- Define Server Owner Requirements
CREATE WBS

Basic principles for creating a WBS:

1. A unit of work should appear at only one place in the WBS.
2. The work content of a WBS item is the sum of the WBS items below it.
3. A WBS item is the responsibility of only one individual, even though many people may be working on it.
4. 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.
5. Project team members should be involved in developing the WBS to ensure consistency and buy-in.
6. Each WBS item must be documented to ensure accurate understanding of the scope of work included and not included in that item.
7. 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.
CREATE WBS - Definitions

**Code of Accounts** - Uniquely identifies each element (box) of the WBS. MS Project, Visio etc. can generate Code of Accounts.

**Chart of Accounts** - Coding structure used by the performing organization to report financial information by category, i.e. labour or supplies. It's generally as given in General Ledger.

**Control Account** - A management control point placed in a WBS element where scope, cost & schedule can be tracked. Also used for planning when work packages are not planned yet. Documented in a Control Account Plan.
CREATE WBS- OUTPUTS

WBS Dictionary
- Document that details each WBS component
- It includes:
  - Code of account identifier
  - a statement of work with defined deliverables
  - Responsible organization
  - List of schedule milestone
- It could include:
  - Contract information
  - Quality requirements
  - Technical references
  - List of associated activities/interdependencies
  - Resources required
  - Cost estimate
CREATE WBS- OUTPUTS

**Scope Baseline** - The *approved* detailed “Project Scope Statement” and its associated WBS & WBS Dictionary.

**Project Document Updates**
## SCOPE PROCESSES

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VERIFY SCOPE

HOW DO WE VERIFY SCOPE?

• Getting the stakeholders' formal acceptance of completed or updated scope & deliverables, i.e. the WBS or the software you delivered

• If a project terminates early, project scope verification should be done next to establish & document the level & extent of completion.

• Scope verification is concerned with acceptance of deliverables, while quality control is concerned with quality of deliverables

• *Quality control is generally performed before scope verification but can be performed in parallel as well*

• It's unethical to ignore Scope Verification because it adds risk to meeting the customer's needs (see PMP Code of Conduct)
VERIFY SCOPE

TOOLS & TECHNIQUES
• Inspection

INPUTS
• Project management plan
  • Requirements documentation
• Requirements Traceability matrix
• Validated Deliverables

OUTPUTS
• Accepted deliverables
• Change requests
• Project document updates
VERIFY SCOPE - INPUTS

INPUTS

Project Management Plan -

Requirements Documentation -

Requirements traceability matrix -

Validated Deliverables - partially or fully completed & are an output of the Direct & Manage Project Execution
VERIFY SCOPE – T&T

TOOLS & TECHNIQUES

Inspection

• Measuring, examining, and verifying to determine whether work or deliverables meet requirements and product acceptance criteria.

• Inspections are also called reviews, product reviews, audits and walkthroughs.
VERIFY SCOPE - OUTPUTS

OUTPUTS

Accepted Deliverables

• Documents those completed deliverables that have been accepted.
• Documents those completed deliverables that have not been accepted, along with the reasons for non-acceptance.
• Includes supporting documentation received from customer or sponsor and acknowledging stakeholders acceptance of the project’s deliverables.

Change Requests -

Project Document updates –
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CONTROL SCOPE

WHAT HAPPENS DURING CONTROL SCOPE? (Change is inevitable)

• Influencing the factor that create project scope changes

• Controlling the impact of those changes

• Assures all requested changes and recommended corrective actions are processed through the project Integrated Change Control process

• Project scope control is used to manage the actual changes when they occur& integrated with other control processes

Note: Uncontrolled changes are often referred to as project scope creep
CONTROL SCOPE

TOOLS & TECHNIQUES
• Variance analysis

INPUTS
• Project management plan
• Work performance information
• Requirements documentation
• Requirements traceability matrix
• Organizational process assets

OUTPUTS
• Work performance measurements
• Organizational process assets updates
• Change requests
• Project management plan updates
• Project document updates
CONTROL SCOPE - INPUTS

INPUTS

Project Management Plan -

Work Performance information -

Requirements documentation -

Requirements Traceability matrix -

Organizational process assets -
CONTROL SCOPE – T&T
TOOLS & TECHNIQUES

Variance Analysis

• Project performance measurements are used to assess the magnitude of variation. Important aspects of scope control include determining cause of variance to scope baseline and deciding whether corrective action is required.

• Time & cost areas (to come) use a mathematical technique called earned value analysis.
CONTROL SCOPE - OUTPUTS

OUTPUTS

Work Performance Measurements -

Organizational Process Assets updates -

Change Requests -

Project Management Plan updates -

Project Document updates -