



**P M tutor**  
Empowering Excellence

# PROJECT SCOPE MANAGEMENT

# 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:**

- **Plan Scope Management**
- **Collect Requirements**
- **Define Scope**
- **Create WBS**
- **Validate Scope**
- **Control Scope**

# PROJECT SCOPE MANAGEMENT

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

# SCOPE PROCESSES

## 5.1 Plan Scope Management

- It is the process of creating a scope management plan that documents how scope will be defined, validated and controlled.

## 5.2 Collect Requirement

- It is the process of determining, documenting, and managing stakeholder need and requirements to meet project objectives.

## 5.3 Define Scope

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

## 5.4 Create WBS

- Subdivide major project deliverables into smaller, more manageable components

## 5.5 Validate Scope

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

## 5.6 Control Scope

- Control changes to the project scope

# SCOPE PROCESSES

## Process by process group

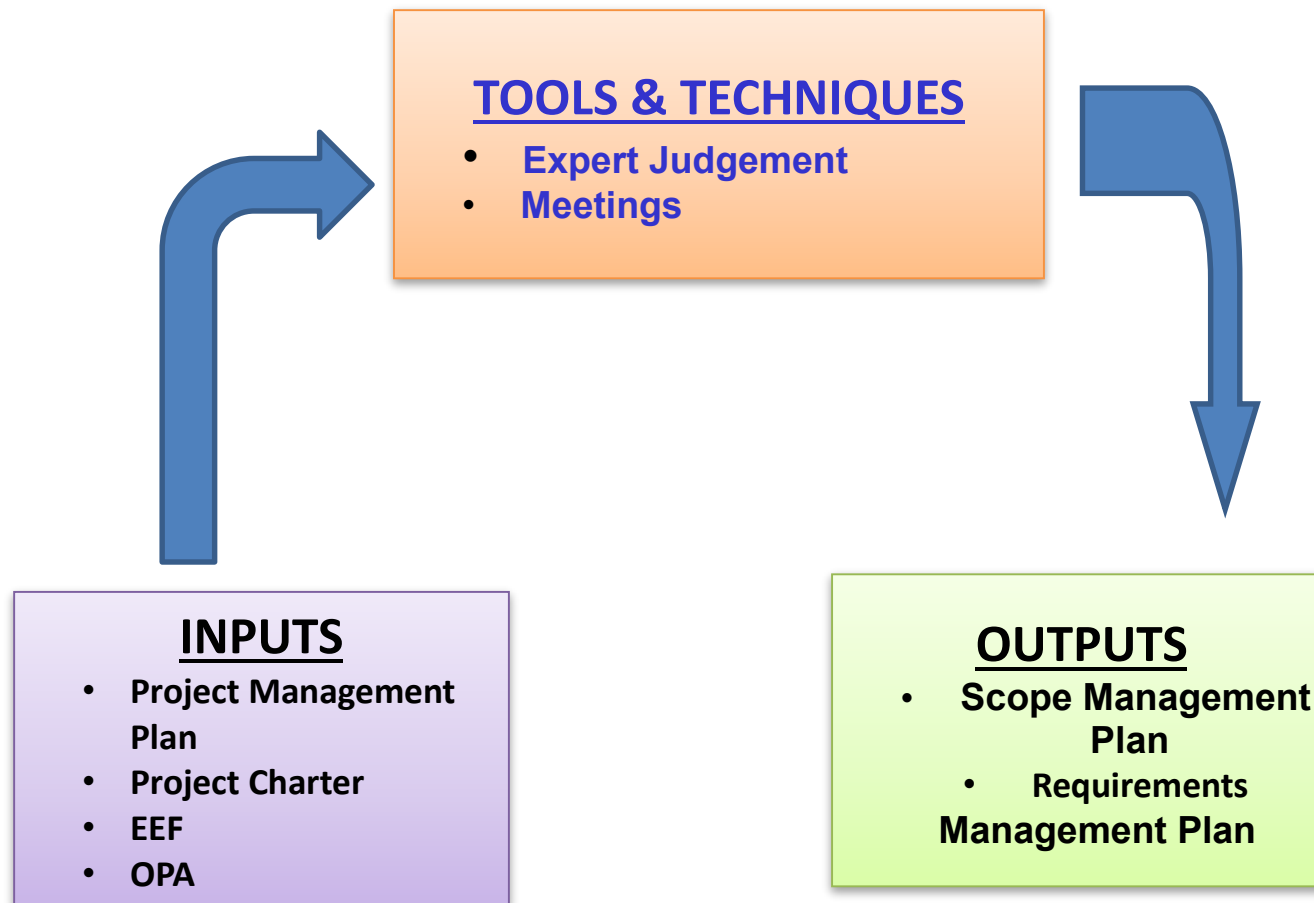
Planning	Monitoring and Controlling
<b>5.1 Plan Scope Management</b>	5.5 Validate Scope
5.2 Collect Requirements	5.6 Control Scope
5.3 Define Scope	
5.4 Create WBS	

# PLAN SCOPE MANAGEMENT

## WHAT HAPPENS IN PLAN SCOPE MANAGEMENT?

The key benefit of this process is that it provides guidance and direction on how scope will be managed throughout the project.

# PLAN SCOPE MANAGEMENT





# PLAN SCOPE MANAGEMENT - INPUTS

## INPUTS

### 1. Project Management Plan

Approved subsidiary plans of the project management plan are used to create the scope management plan and influence approach taken for planning and managing project scope.

### 2. Project Charter

It provides the project context used to plan the scope management processes. It provides high-level project description and product characteristics from the project sow.

### **3. Enterprise Environmental Factors**

The EEF that can influence the Plan Scope Management process include, but are not limited to:

- Organization's Culture
- Infrastructure
- Personal Administration
- Marketplace Condition

### **4. Organization Process Assets**

The OPA that can influence the Plan Scope Management process include, but are not limited to:

- Policies and Procedure
- Historical Information and lessons learned knowledge base.

## Tools & Techniques

### 1. Expert judgment

Input received from knowledgeable and experienced parties in developing scope management plan.

### 2. Meetings

Project teams may attend meeting to develop the scope management plan.

## OUTPUTS

### 1. **Scope Management Plan**

It is a component of the project management plan that describes how scope will be defined, developed, monitored, controlled and verified.

### 2. **Requirement Management Plan**

It is a component of the project management plan that describes how requirement will be analyzed, documented and managed. The project manager chooses the most effective relationship for the project and documents this approach in the requirement management plan.

# SCOPE PROCESSES

## Process by process group

Planning	Monitoring and Controlling
5.1 Plan Scope Management	5.5 Validate Scope
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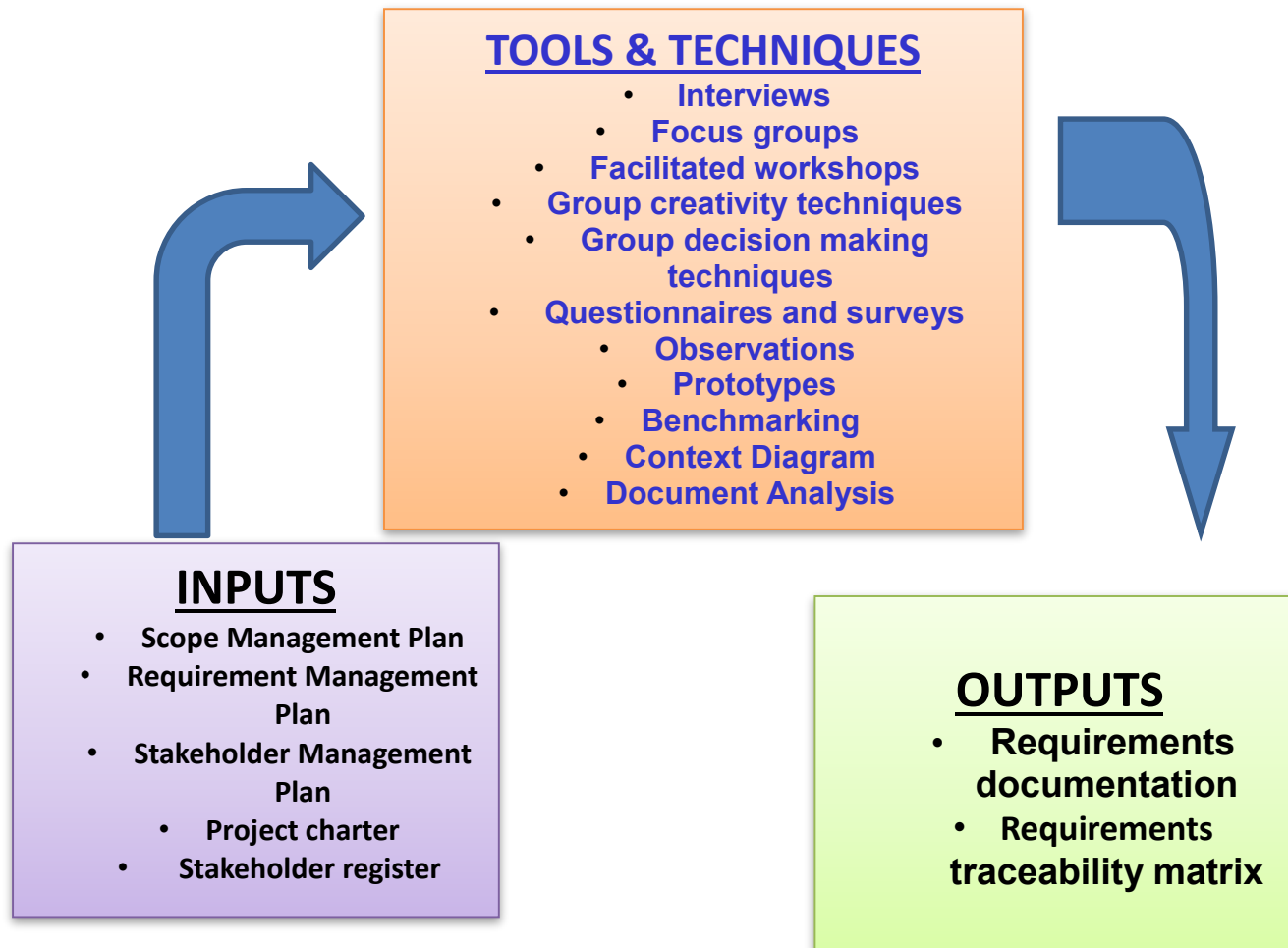
# COLLECT REQUIREMENTS

## 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



# COLLECT REQUIREMENTS - INPUTS

## INPUTS

### 1. **Scope Management Plan**

It provides clarity as to how project teams will determine which type of requirements need to be collected for the project

### 2. **Requirement Management Plan**

It provides the processes that will be used throughout the Collect Requirement process to define and document the stakeholder needs.

### 3. **Stakeholder Management Plan**

It is used to understand stakeholder communication requirements and the level of stakeholder engagement in order to assess and adapt to the level of stakeholder participation in requirements activities.



## 4. Project Charter

It is used to provide high-level description of the product service, or result of the project so that detailed requirements can be developed.

## 5. 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

**3. Expert judgment**

**4. 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. 5.2.3.1, page 117 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 requirement

# SCOPE PROCESSES

## Process by process group

Planning	Monitoring and Controlling
5.1 Plan Scope Management	5.5 Validate Scope
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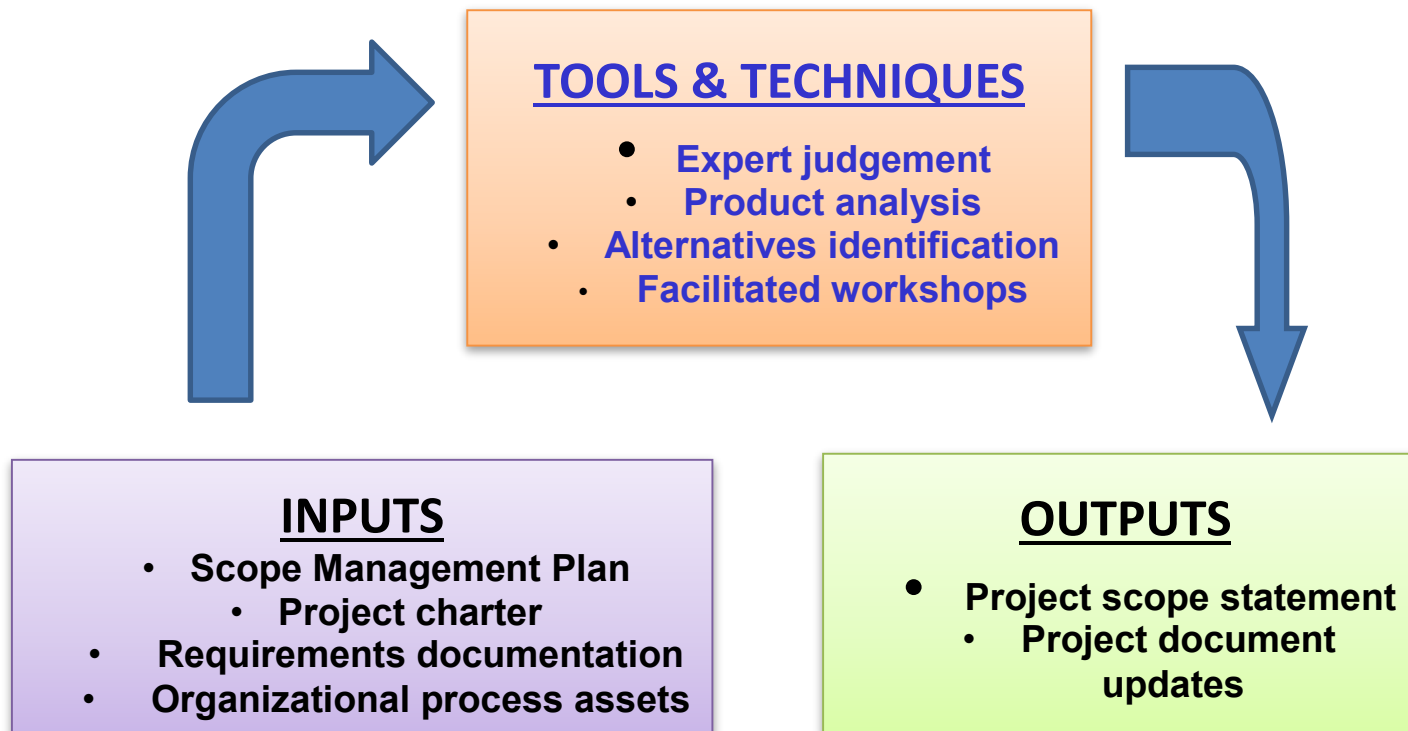
# DEFINE SCOPE

## 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



# DEFINE SCOPE - INPUTS

## INPUTS

- **Scope Management Plan**  
Described in section 5.1.3.1 of the PMBOK Guide
- **Project Charter**  
High-level project description and product characteristics
- **Requirements documentation**  
Described in Sec. 5.2.3.1 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 5.2.2.3 of the PMBOK Guide

# DEFINE SCOPE - OUTPUTS

## 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 123 of PMBOK thoroughly)

# DEFINE SCOPE - OUTPUTS

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



# DEFINE SCOPE - OUTPUTS

## 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

## Process by process group

Planning	Monitoring and Controlling
5.1 Plan Scope Management	5.5 Validate Scope
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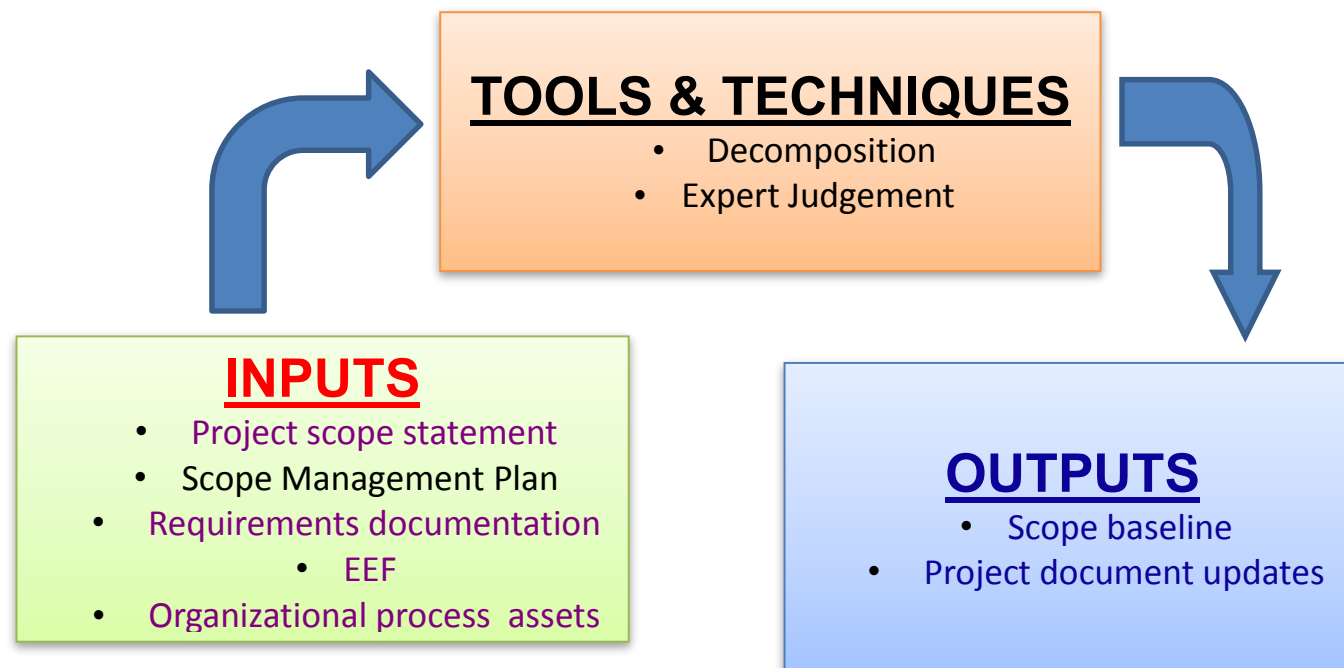
# CREATE WBS

## 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 5-11 in page120 of PMBOK)

# CREATE WBS



# CREATE WBS - INPUTS

## INPUTS

- **Project Scope Statement**
- **Requirements Documentation**
- **Organizational Process Assets**

# CREATE WBS – T&T

## TOOLS & TECHNIQUES

### 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:

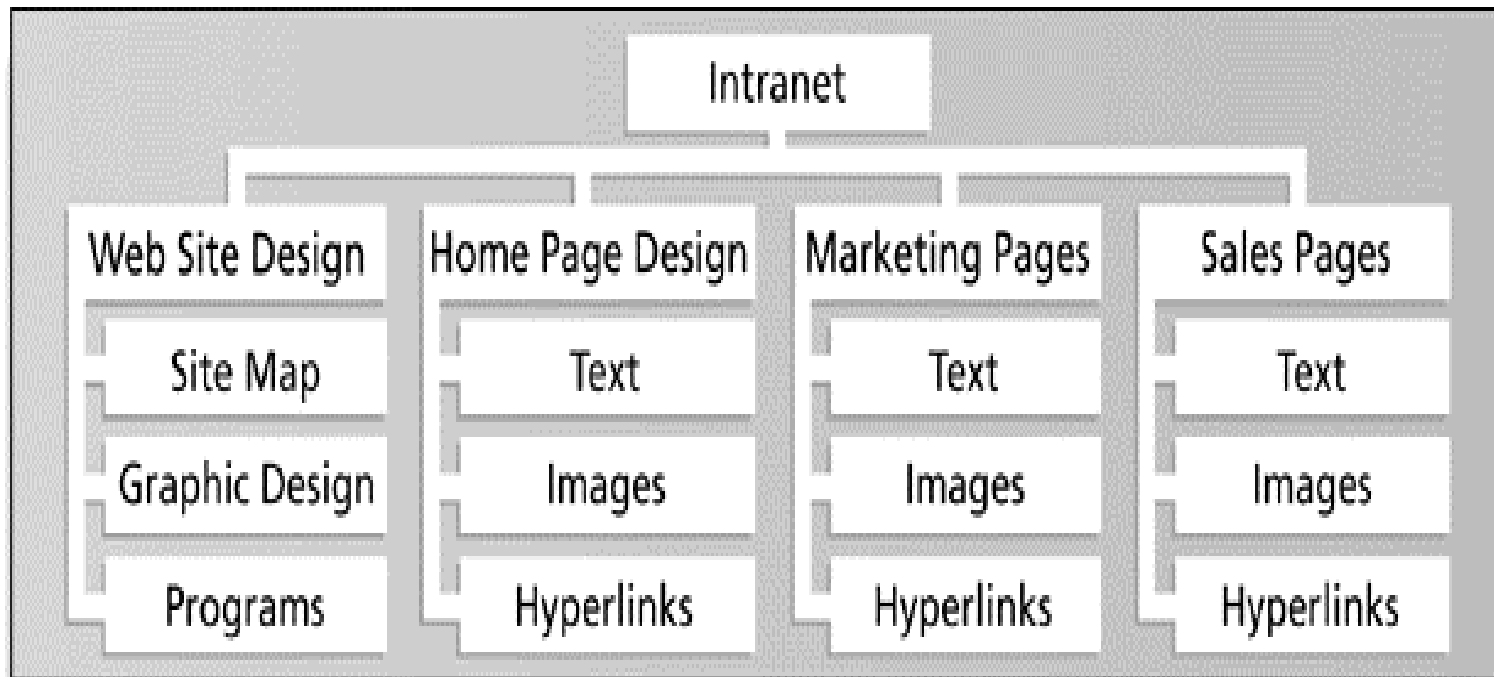
- Identifying the deliverables and related work
- Structuring and organizing the WBS
- Decomposing the upper WBS levels into lower level detailed components.
- Develop & Assign identification codes to each WBS component (code of account)
- Verifying that the degree of decomposition of the work is necessary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

# APPROACHES TO DEVELOP WBS

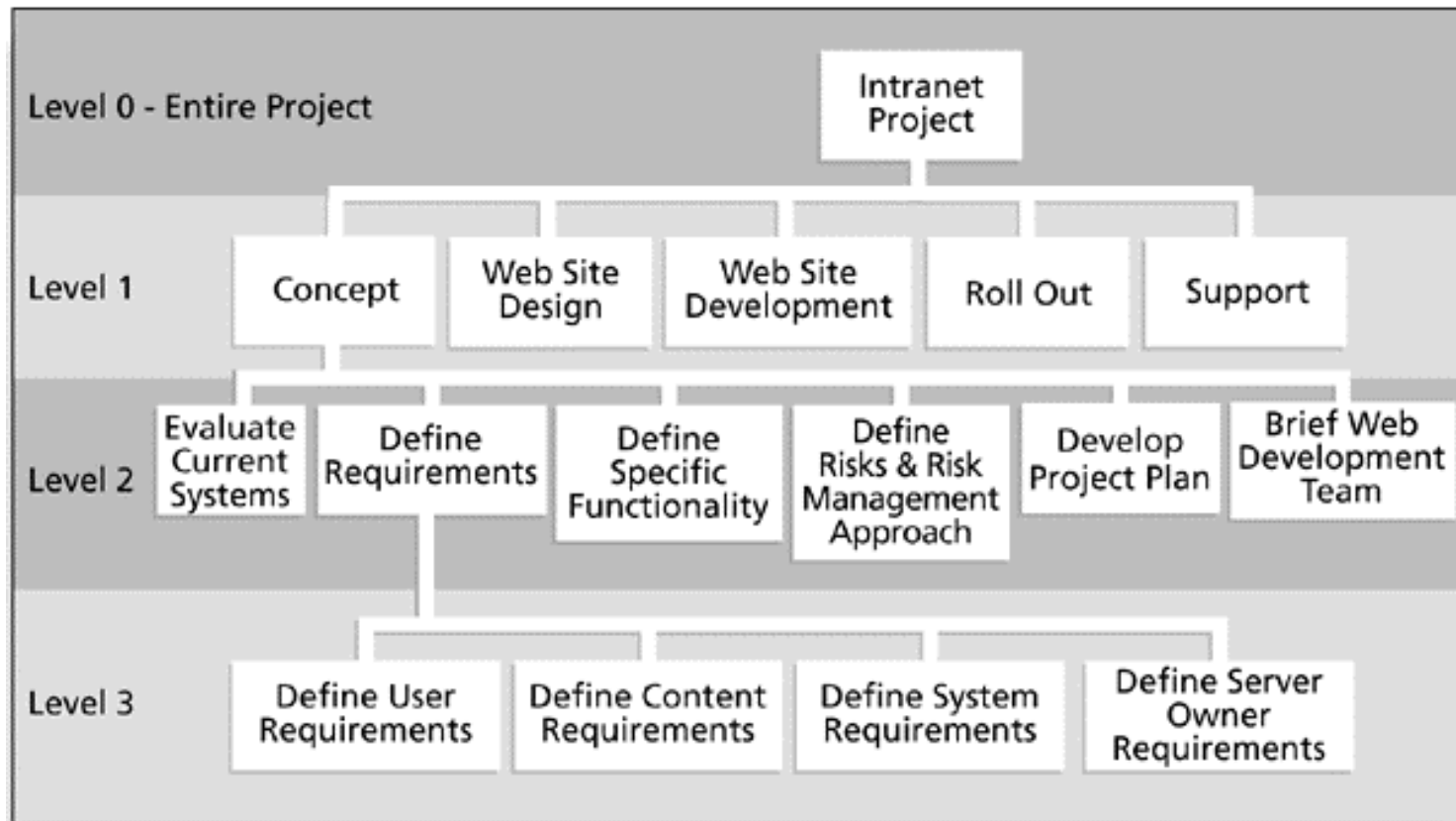
- Using guidelines: Some organizations, like the DOD, provide guidelines for preparing WBSs
- The analogy approach: It often helps to review WBSs of similar projects
- The top-down approach: Start with the largest items of the project and keep breaking them down
- The bottoms-up approach: Start with the detailed tasks and roll them up

# CREATE WBS

## SAMPLE INTRANET WBS ORGANIZED BY PRODUCT



## SAMPLE INTRANET WBS ORGANIZED BY PHASE



# 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

## Process by process group

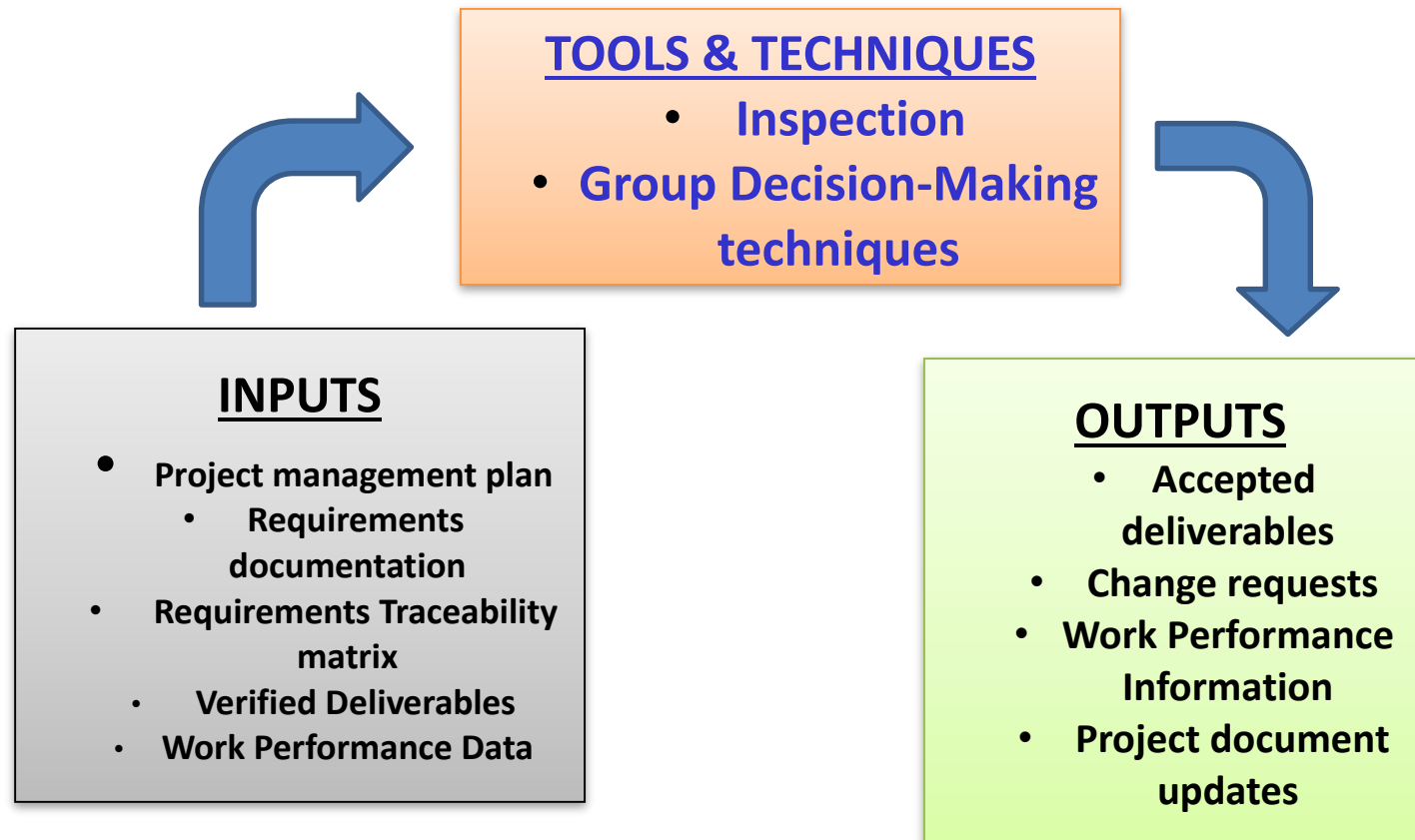
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5.3 Define Scope	
5.4 Create WBS	

# VALIDATE SCOPE

## HOW DO WE VALIDATE 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)

# VALIDATE SCOPE



# VALIDATE SCOPE - INPUTS

## INPUTS

**Project Management Plan** – Section 4.2.3.1 of PMBOK Guide

**Requirements Documentation** – Section 5.2.3.1 of PMBOK Guide

**Requirements traceability matrix** – Section 5.2.3.2 of the PMBOK Guide

**Verified Deliverables** – project deliverable that are complete and checked for correctness through Control Quality Process

**Work Performance Data** – Work performance data can include the degree of compliance with requirements, number of conformities, severity of conformities, or the number of validation cycles performed in a period of time.

# VALIDATE 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.

### Group Decision-Making Techniques

These techniques are used to reach a conclusion when the validation is performed by the project team and other stakeholders.

# VALIDATE 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 –

Work Performance Information – It includes information about project progress.

# SCOPE PROCESSES

## Process by process group

Planning	Monitoring and Controlling
5.1 Plan Scope Management	5.5 Verify Scope
5.2 Collect Requirements	5.6 Control Scope
5.3 Define Scope	
5.4 Create WBS	

# CONTROL SCOPE

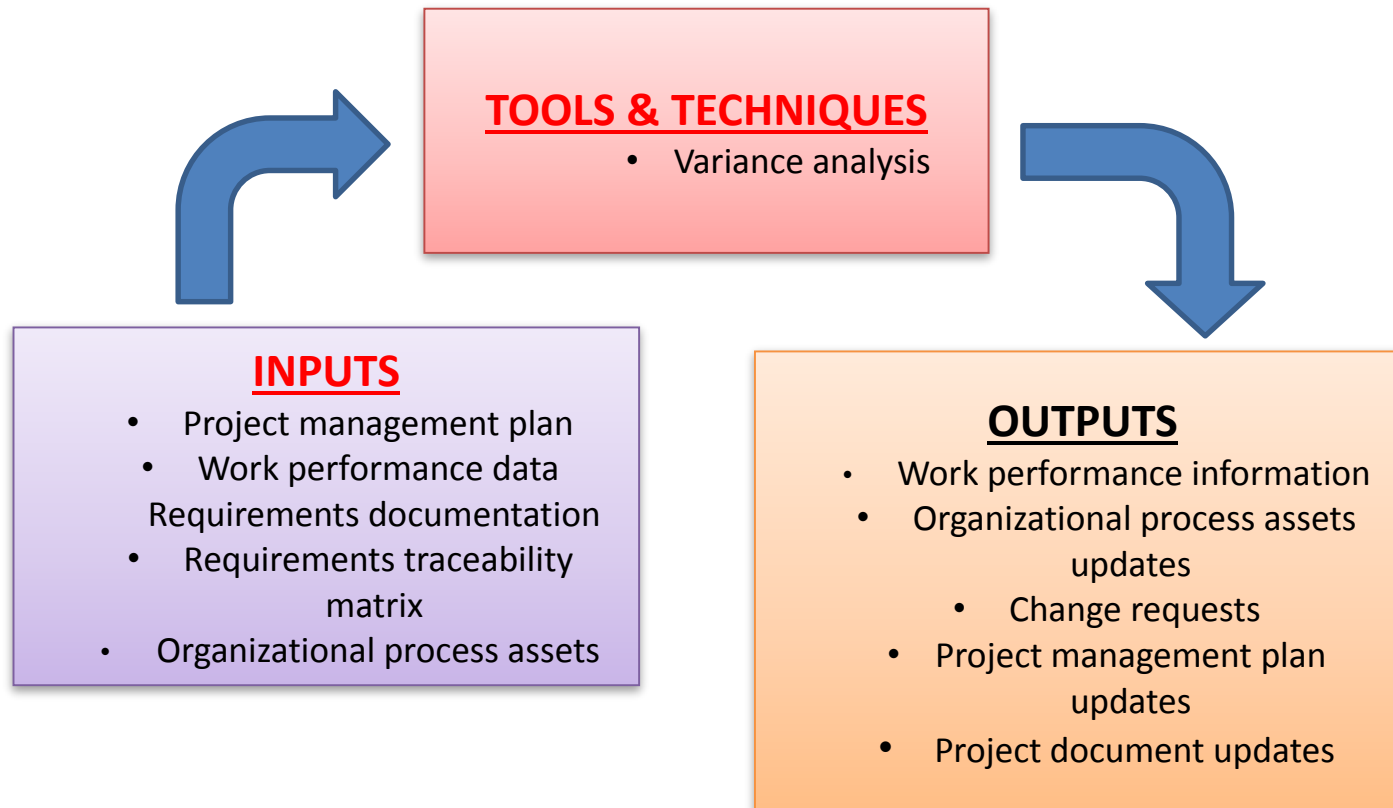
## WHAT HAPPENS DURING CONTROL SCOPE? (Change is inevitable)

- 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



# **CONTROL SCOPE - INPUTS**

## **INPUTS**

**Project Management Plan – 4.2.3.1 of the PMBOK Guide**

**Work Performance data – 4.3.3.2 of the PMBOK Guide**

**Requirements documentation – 5.2.3.1 of the PMBOK Guide**

**Requirements Traceability matrix – 5.2.3.2 of the PMBOK Guide**

**Organizational process assets – 2.1.4 of the PMBOK Guide**

# 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 Information -**

**Organizational Process Assets updates -**

**Change Requests -**

**Project Management Plan updates -**

**Project Document updates -**

