

Project Scope Management in PMBOK made easy

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The main objective of any project is to fulfill the scope of the project on time and within the budget.

What is Project Scope?

Scope refers to all the work involved in creating the deliverables of the project and the processes used to create them. Project scope management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. Uncontrolled changes are often referred to as project scope creep; it is the duty of the project manager to see that the changes are managed without increasing cost and time.

There are two types of scope that are Product Scope and Project Scope

- Product scope: The features & functions that characterize the product, service, or result documented usually by the Business Analyst in consultation with the stakeholders.
- Project Scope: The work that needs to be accomplished to deliver a product, service, or result with the specified features and functions.

Project has to be completed by fulfilling the customer requirements related to product functionalities as well as the project expectation that is on time within budget. Generally the product scope will be managed and monitored by the line managers this is called engineering management, whereas project managers will be concentrated on project integration, scope, time, cost, quality, resource, communication, risk, procurement and stakeholder management. In some companies Project managers has to perform both, the problems faced in such type of situation is that the project manager may be more concentrating on his technical capabilities and mostly doing the line managers job that is engineering management and may be failed to perform project management (this is called halo effect).

Plan Scope Management

The first process in this knowledge area is to Plan Scope Management which is coming under planning process group. This is the process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled. It provides guidance and directions on scope will be managed.

Plan Scope Management: Inputs

1. Project Management Plan: it defines how the project is executed, monitored, controlled and closed. It integrates all plan components.
2. Project Charter
3. Enterprise Environmental Factors
4. Organizational Process Assets

Plan Scope Management: T & T

1. Expert Judgment from knowledgeable and experienced parties.
2. Meetings with stakeholders

Plan Scope Management: Output

1. Scope Management Plan. It includes:
 - Process for preparing a detailed project scope statement.
 - Process to enable the creation of WBS
 - Process to establish how the WBS will be managed
 - Define formal acceptance criteria of deliverables
 - How change requests will be applied to scope
2. Requirements Management Plan: describes how requirements will be analyzed, documented, and managed. It includes, but not limited to:
 - How requirements activities will be planned, tracked and reported.
 - Configuration management activities (managing changes in the functionalities of the product).
 - Requirements prioritization process.
 - Product metrics (contains major functionalities of product and it's user groups)

Collect requirements

The second process in this knowledge area is to collect requirements from the concerned stakeholders; this is also coming under planning process group. This is the process of determining; documenting and managing stakeholder needs to meet project objectives. The key benefit is to provide the basis for defining and managing project scope.

- Requirements include the quantified and documented needs and expectations of the sponsor, customer, and other stakeholders.

- Requirement must be analyzed and recorded in a clear and detailed way to be measured.

Requirements can be grouped into classifications including:

- Business requirements, describe the high-level needs of the organization as a whole.
- Stakeholder requirements, describe needs of a stakeholder or stakeholder group.
- Solution requirements, describe features, functions and characteristics of the product, service, or results.
- Transition requirements; describe temporary capabilities such as data conversion & training needs.

Collect Requirements: Inputs

1. Project Scope Management Plan
2. Requirements Management Plan
3. Stakeholder Management Plan
4. Project Charter
5. Stakeholder Register

Collect Requirements: T & T

1. Interviews: meeting the stakeholders to ask prepared and spontaneous question & recording the responses.
2. Focus groups: bring together stakeholders and subject matter experts to learn about their expectations and attitudes about a proposed product, service or result.
3. Facilitated Workshops: Focused session with key cross-functional stakeholders to define product requirements.
4. Group Creativity Techniques:
 - a. Brainstorming: A group discussion in a room to form a solution
 - b. Delphi Technique: Get the views from the experts from different locations and select a solution with the help of a facilitator.
 - c. Nominal Group: Each one in the group writes a solution in a board and discuss in detail about that.
 - d. Idea/Mind Mapping: Using a pencil and paper work it out until the requirements are clear.
 - e. Affinity Diagram: Diagrammatic representation of requirements
 - f. Multi-criteria decision analysis: Decision Analysis to match different situation to see that all criteria's related to requirement are met
5. Group Decision Making Techniques

- a) Unanimity : Unanimous decision
 - b) Majority : Majority decides the solution
 - c) Plurality : If there are 10 members in a group let us assume 3 people have agreed to solution A, other 3 people agreed to solution B, and rest of the 4 people agreed to solution C, then accept solution C this is called plurality.
 - d) Dictatorship: One person takes the decision and all have to accept.
6. Questionnaire and Surveys
 7. Observations: Go to customer site and observe, how the system is moving
 8. Prototypes: Prototype models are demonstrated to get more specifications or requirements.
 9. Benchmarking : Comparing system performance with other systems
 10. Context Diagrams: Draw the diagram of situation for more visibility
 11. Document Analysis: Understand how the documents are prepared.

Collect Requirements: Outputs

1. Requirements Document contains :
 - a) Business Requirements
 - b) Stakeholder requirements
 - c) Solution requirements
 - d) Project requirements
 - e) Transition requirements
2. Requirements Traceability Matrix: matrix representation of requirements of different people or sections in an organization.

Define Scope

The third process in this knowledge area is to define Scope which is coming under planning process group, the process of developing a detailed description of the project and product. The project scope serves as a reference for all future project decisions.

Define Scope: Inputs

1. Scope Management Plan
2. Project charter
3. Requirements Document
4. Organizational Process Assets (Procedures & Templates , Historical Data, Lessons learned from old Projects)

Define Scope: T & T

1. Expert Judgment
2. Product Analysis (System analysis, Value analysis)
3. Alternatives Generations (One problem can be solved in different ways, generate different alternatives ways to produce a product, service or result to select the best, this is possible through systems analysis)
4. Facilitated workshops

Define Scope: Outputs

1. Scope Statement: describes project's deliverables and the work required to create those deliverables. It includes
 - a) Product scope description
 - b) Deliverables' Acceptance Criteria
 - c) Project Deliverables
 - d) Project Exclusion
 - e) Project Assumptions
 - f) Constraints
2. Project Documents Updates: may include, but not limited to:
 - a. Stakeholder register
 - b. Requirements Documents
 - c. Requirements Traceability Matrix

Create Work Breakdown Structure

The fourth process in this knowledge area is to Create Work Breakdown Structure which is coming under planning process group, in this process subdividing the project deliverables and project work into smaller and more manageable components. The work breakdown structure is a deliverable-oriented hierarchical decomposition of project work.

Create WBS: Inputs

1. Scope Management Plan
2. Project Scope Statement
3. Requirements Document
4. Enterprise Environmental Factors
5. Organizational Process Assets

Create WBS: T & T

1. Decomposition: The subdivision of project deliverables into smaller, more manageable components. The work package level is the lowest level in the WBS, and is the point at which the cost and activity durations can be reliably estimated and managed. The level of detail for work packages will vary with the size and complexity of the project. Normally the level of decomposition can be up to 8 - 80 hour heuristic that is if someone can do all the activities in the work packages with in one day(8 hours) or within 10 days (80 hrs.), then don't decompose further. (Please refer the diagram given below). In complex projects the work packages are suitably grouped under different control of accounts for the ease of management.
2. Expert Judgment

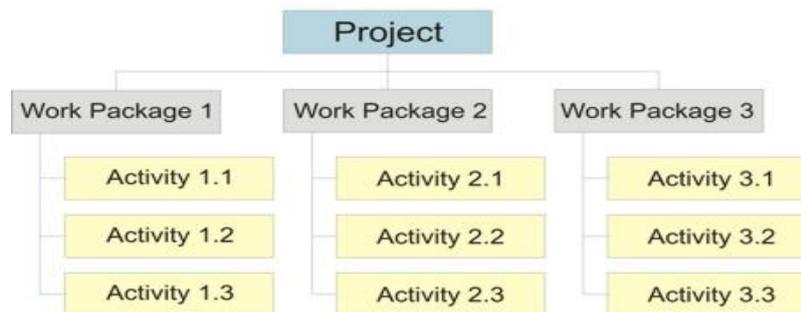
Create WBS: Outputs

1. Scope Baseline
 - a. Project Scope Statement
 - b. WBS
 - c. WBS Dictionary
2. Project Documents updates
3. WBS Dictionary may include (but not limited to)
 - a. Code of Account Identifier
 - b. Description of work
 - c. Assumptions and Constraints
 - d. Schedule Milestone
 - e. Resource required
 - f. Cost Estimate
 - g. Acceptance criteria
 - h. Quality Requirements



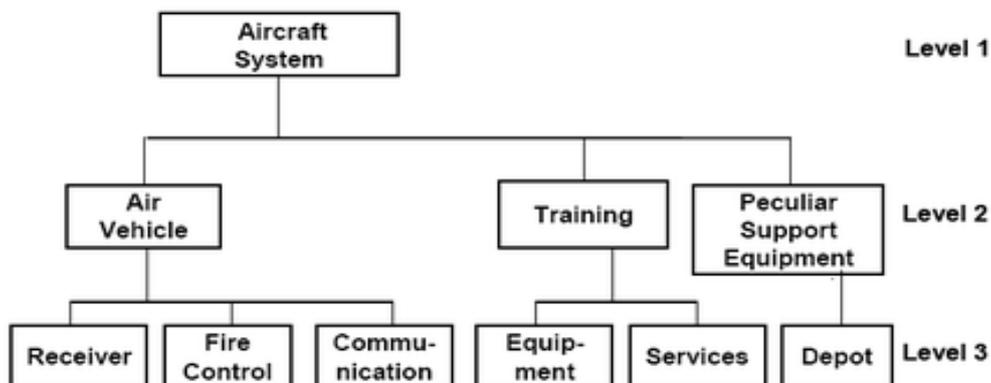
There can be many work packages under each task depending upon the nature of the project

(Fig. a)



(Fig. b)

In WBS the project will be decomposed up to the work package level only



WBS of an aircraft system project shown here in (Fig. c)

Level 3 above (Fig. c) is at the work package level and there will be many activities under each work package level is as shown in (Fig. b) above. All these work packages will be grouped under different control of accounts for example there can be one control of accounts for task1 refer (Fig. a) & Air Vehicle in (Fig. c) is a control of accounts and under that control of accounts there can be different work packages, but we have shown only one work package in (Fig. a) and in (Fig. c) we have 3 different work packages for Receiver, Fire Control and Communication, under each of these work packages there can be a list of activities as shown in Fig. b)

Validate Scope

The fifth process in this knowledge area is to validate Scope which comes in monitoring and control process group, means formalizing the acceptance of the completed project deliverables by the customer. This includes reviewing deliverables with the client and obtaining formal acceptance of deliverables. Scope validation is concerned with acceptance of deliverables by the external customer while quality control is concerned with checking the correctness of the deliverables internally and meeting quality requirements.

Validate Scope: Inputs

1. Project Management Plan
2. Requirements Documentation
3. Requirements Traceability Matrix (Requirements are placed systematically in matrix form)
4. Validated Deliverables
5. Work Performance Data (Data regarding the actual work)

Valid Scope T & T

1. Inspection by customer
2. Group Decision making Techniques

Validate Scope Outputs

1. Accepted Deliverables
2. Change Request
3. Work Performance Information (Information received while comparing actual work with the planned work)
4. Project Document Updates

Control scope

The sixth and last process in this knowledge area which comes under monitoring and control process group this is to control scope means monitoring the status of the project & products scope and managing changes to scope baseline. Ensure all requested changes and

recommended corrective or preventive actions are processed through the “Perform Integrated Change Control” process. Control Scope process will control the scope creep.

Control Scope Inputs

1. Project Management Plan
 - a) Scope baseline
 - b) Scope management plan
 - c) Change management plan
 - d) Configuration management plan
 - e) Requirements management plan
2. Requirement Documentation
3. Requirement Traceability Matrix
4. Work Performance data
5. Organizational process Assets

Control Scope T & T

1. Variance Analysis: Analyze the performance measurements to assess the variation from the scope baseline. Analysis should determine the cause and degree of variance.

Control Scope Outputs

1. Work Performance Information
2. Change Request
3. Project management Plan Updating
4. Project Document Updates
5. Organizational Process Assets updates

Increased scope means increased time and cost, therefore it is the duty of the project manager to build the scope baseline and control the scope changes and finish the project on time and within the budget.

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About the Author



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