Scope Management

CS413 - Software Engineering Project Management

Department of Computer Engineering, Bilkent University

Dr. Mustafa Değerli
Key Terms

- **Scope.** The sum of the products, services, and results to be provided as a project
Key Terms

- **Scope Baseline.** The approved version of a scope statement, work breakdown structure (WBS), and its associated WBS dictionary, that can be changed using formal change control procedures and is used as a basis for comparison to actual results.
Key Terms

• **Scope Creep.** The uncontrolled expansion to product or project scope without adjustments to time, cost, and resources

• **Scope Management Plan.** A component of the project or program management plan that describes how the scope will be defined, developed, monitored, controlled, and validated
Key Concepts

• Scope can refer to

• Product scope (the features and functions that characterize a product, service, or result), or

• Project scope (the work performed to deliver a product, service, or result with the specified features and functions)
Key Concepts

• In a life cycle that uses a predictive approach, the project deliverables are defined at the beginning of the project and any changes to the scope are progressively managed
Key Concepts

• In an adaptive or agile approach, the deliverables are developed over multiple iterations where a detailed scope is defined and approved for each iteration when it begins
Key Concepts

• **Completion of the project scope** is measured against the **project management plan**

• **Completion of the product scope** is measured against the **product requirements**
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.

• Managing the project scope is primarily concerned with defining and controlling what is and is not included in the project.
Scope Management Processes

• 1 Plan Scope Management
• The process of creating a scope management plan that documents how the project and product scope will be defined, validated, and controlled
Scope Management Processes

- **2 Collect Requirements**
  - The process of determining, documenting, and managing stakeholder needs and requirements to meet project objectives

- **3 Define Scope**
  - The process of developing a detailed description of the project and product
Scope Management Processes

• **4 Create WBS**
  - The process of subdividing project deliverables and project work into smaller, more manageable components

• **5 Validate Scope**
  - The process of formalizing acceptance of the completed project deliverables
Scope Management Processes

• 6 Control Scope

• The process of monitoring the status of the project and product scope and managing changes to the scope baseline
Plan Scope Management

**Inputs**

1. Project charter
2. Project management plan
   - Quality management plan
   - Project life cycle description
   - Development approach
3. Enterprise environmental factors
4. Organizational process assets

**Tools & Techniques**

1. Expert judgment
2. Data analysis
   - Alternatives analysis
3. Meetings

**Outputs**

1. Scope management plan
2. Requirements management plan
# Software Engineering Project Management

## Scope Management

### Collect Requirements

<table>
<thead>
<tr>
<th>Inputs</th>
<th>Tools &amp; Techniques</th>
<th>Outputs</th>
</tr>
</thead>
</table>
| .1 Project charter  
 .2 Project management plan  
   - Scope management plan  
   - Requirements management plan  
   - Stakeholder engagement plan  
 .3 Project documents  
   - Assumption log  
   - Lessons learned register  
   - Stakeholder register  
 .4 Business documents  
   - Business case  
 .5 Agreements  
 .6 Enterprise environmental factors  
 .7 Organizational process assets | .1 Expert judgment  
 .2 Data gathering  
   - Brainstorming  
   - Interviews  
   - Focus groups  
   - Questionnaires and surveys  
   - Benchmarking  
 .3 Data analysis  
   - Document analysis  
 .4 Decision making  
   - Voting  
   - Multicriteria decision analysis  
 .5 Data representation  
   - Affinity diagrams  
   - Mind mapping  
 .6 Interpersonal and team skills  
   - Nominal group technique  
   - Observation/conversation  
   - Facilitation  
 .7 Context diagram  
 .8 Prototypes | .1 Requirements documentation  
 .2 Requirements traceability matrix |
Software Engineering Project Management

Scope Management

4.1 Develop Project Charter
- Project charter

Project Management Plan
- Project management plan
- Requirements management plan
- Scope management plan
- Stakeholder engagement plan

Project Documents
- Project documents
  - Assumption log
  - Lessons learned register
  - Stakeholder register

Business Documents
- Business documents
  - Business case

12.2 Conduct Procurements
- Agreements

5.2 Collect Requirements
- Requirements documentation
- Requirements traceability matrix

Project Documents
- Enterprise environmental factors
- Organizational process assets
### Requirements Traceability Matrix

<table>
<thead>
<tr>
<th>ID</th>
<th>Associate ID</th>
<th>Requirements Description</th>
<th>Business Needs, Opportunities, Goals, Objectives</th>
<th>Project Objectives</th>
<th>WBS Deliverables</th>
<th>Product Design</th>
<th>Product Development</th>
<th>Test Cases</th>
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# Scope Management

## Define Scope

### Inputs
1. Project charter
2. Project management plan
   - Scope management plan
3. Project documents
   - Assumption log
   - Requirements documentation
   - Risk register
4. Enterprise environmental factors
5. Organizational process assets

### Tools & Techniques
1. Expert judgment
2. Data analysis
   - Alternatives analysis
3. Decision making
   - Multicriteria decision analysis
4. Interpersonal and team skills
   - Facilitation
5. Product analysis

### Outputs
1. Project scope statement
2. Project documents updates
   - Assumption log
   - Requirements documentation
   - Requirements traceability matrix
   - Stakeholder register
Software Engineering Project Management

Scope Management

Create WBS

**Inputs**

- 1. Project management plan
   - Scope management plan
- 2. Project documents
   - Project scope statement
   - Requirements documentation
- 3. Enterprise environmental factors
- 4. Organizational process assets

**Tools & Techniques**

- 1. Expert judgment
- 2. Decomposition

**Outputs**

- 1. Scope baseline
- 2. Project documents updates
  - Assumption log
  - Requirements documentation
The WBS is illustrative only. It is not intended to represent the full project scope of any specific project, nor to imply that this is the only way to organize a WBS on this type of project.
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Software Engineering Project Management

Scope Management

**Validate Scope**

**Inputs**
1. Project management plan
   - Scope management plan
   - Requirements management plan
   - Scope baseline
2. Project documents
   - Lessons learned register
   - Quality reports
   - Requirements documentation
   - Requirements traceability matrix
3. Verified deliverables
4. Work performance data

**Tools & Techniques**
1. Inspection
2. Decision making
   - Voting

**Outputs**
1. Accepted deliverables
2. Work performance information
3. Change requests
4. Project document updates
   - Lessons learned register
   - Requirements documentation
   - Requirements traceability matrix
Scope Management

- Project Management Plan
  - Project management plan
  - Scope management plan
  - Requirements management plan
  - Scope baseline

- 4.3 Direct and Manage Project Execution
  - Work performance data

- 8.3 Control Quality
  - Verified deliverables

- Project Documents
  - Project documents
    - Lessons learned register
    - Quality report
    - Requirements documentation
    - Requirements traceability matrix

- 5.5 Validate Scope
  - Accepted deliverables
  - Change requests
  - Work performance information

- 4.5 Monitor and Control Project Work
  - Project documents updates
    - Lessons learned register
    - Requirements documentation
    - Requirements traceability matrix

- 4.6 Perform Integrated Change Control

- 4.7 Close Project or Phase
## Control Scope

### Inputs
1. Project management plan
   - Scope management plan
   - Requirements management plan
   - Change management plan
   - Configuration management plan
   - Scope baseline
   - Performance measurement baseline
2. Project documents
   - Lessons learned register
   - Requirements documentation
   - Requirements traceability matrix
3. Work performance data
4. Organizational process assets

### Tools & Techniques
1. Data analysis
   - Variance analysis
   - Trend analysis

### Outputs
1. Work performance information
2. Change requests
3. Project management plan updates
   - Scope management plan
   - Scope baseline
   - Schedule baseline
   - Cost baseline
   - Performance measurement baseline
4. Project documents updates
   - Lessons learned register
   - Requirements documentation
   - Requirements traceability matrix
## Scope Management

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<thead>
<tr>
<th>Knowledge Areas</th>
<th>Project Management Process Groups</th>
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<td>Initiating Process Group</td>
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<td>Planning Process Group</td>
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<td>Monitoring and Controlling Process Group</td>
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<td>Closing Process Group</td>
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<td>5. Project Scope Management</td>
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<td>5.2 Collect Requirements</td>
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<td>5.4 Create WBS</td>
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<td>5.6 Control Scope</td>
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Tailoring Considerations

• Knowledge and requirements management
• Does the organization have formal or informal knowledge and requirements management systems?
• What guidelines should the project manager establish for requirements to be reused in the future?
Tailoring Considerations

• Validation and control
• Does the organization have existing formal or informal validation and control-related policies, procedures, and guidelines?
Tailoring Considerations

- Use of agile approach
- Does the organization use agile approaches in managing projects?
- Is the development approach iterative or incremental?
- Is a predictive approach used?
- Will a hybrid approach be productive?
Tailoring Considerations

- Governance

- Does the organization have formal or informal audit and governance policies, procedures, and guidelines?
References

• A guide to the project management body of knowledge (PMBOK guide), Sixth Edition, 2017 / Project Management Institute.