PROJECT MANAGEMENT

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PMP® Certification Training

Lesson 06: Project Scope Management

This course is based on the Project Management Institute, *A Guide to the Project Management of Body of Knowledge (PMBOK® Guide)* – Sixth Edition.
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PROJECT MANAGEMENT

Objectives

- Define Project Scope Management
- Differentiate between project scope and product scope
- Identify the key terms used in Project Scope Management
- Explain work breakdown structure
- Describe the Project Scope Management processes

What Is Project Scope Management?

The definition of Project Scope Management is as follows:

Project Scope Management includes the processes required to ensure that a 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 should be included in the project.

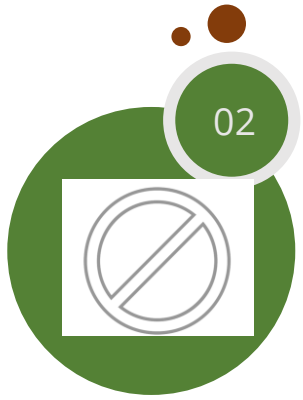
*Definitions taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute, Inc., 2017, Page 129

Project Scope Management Activities

The key activities of Project Scope Management are as follows:

Ensure Constant Monitoring

Ensure all the project work is being completed



Avoid Scope Creep

Define project boundaries and avoid unnecessary addition of scope

Prevent Gold Plating

Restrict the project work only to the defined activities and avoid doing more work than required for the project

Product Scope vs. Project Scope

Project Scope Management deals with managing both the product scope as well as the project scope.

The difference between project scope and product scope is as follows:

*Product Scope

Product scope refers to the features and functions that characterize a product, service, or result.

Example: In banking sector, services like savings accounts and mutual funds are called products.

*Project Scope

Project scope refers to the work performed to deliver a product, service, or result with the specified features and functions. Project Scope is often inclusive of Product Scope.

Example: To deliver a product, requirement and design documents have to be produced. This is a part of project scope and not product scope.

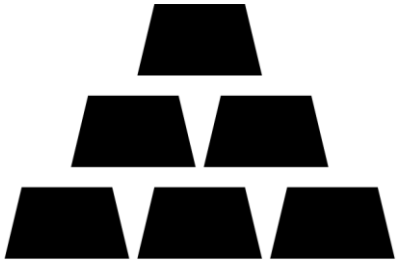
*Definitions taken from the Glossary of the Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute, Inc., 2017, Page 131

Definition of Work Breakdown Structure (WBS)

A deliverable-oriented, functional decomposition of the project scope of work into hierarchically grouped work elements

Work Breakdown Structure (WBS) reflects the scope baseline of the entire project. Deliverables not incorporated in WBS will not be a part of the project.

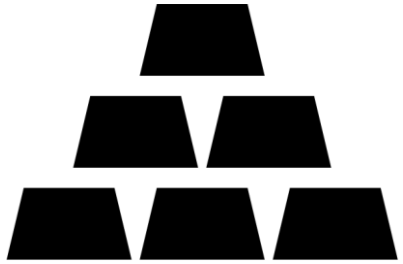
- WBS is prepared with the team's buy-in.
- During decomposition, each level should be complete; it should include all the work in the project before decomposing further.
- Decomposition should be done until the lowest work unit cannot be logically sub-divided further (and/or it can be estimated with reasonable accuracy).
- WBS is a deliverable-oriented decomposition and should contain only deliverables and not activities.
- WBS is part of Project Scope Baseline along with Project Scope Statement and WBS Dictionary.



Concept-based questions on work breakdown structure can be expected in the exam.

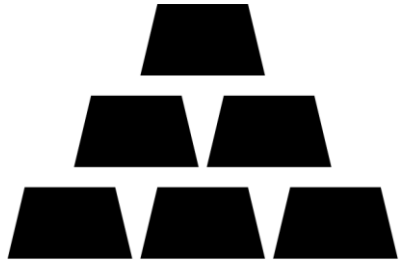
Work Breakdown Structure (WBS)

- A WBS defines the total project work.
- If a deliverable is not in the WBS, it is not in the project.
- Each descending level of a WBS represents an increasingly detailed definition of the project work to be performed.
- The WBS is the foundation for project task definition, resource and performance planning, cost estimating, budget control, progress tracking, and status reporting.



Definition of WBS (Contd.)

Work packages are considered decomposed at their lowest level when decomposing them offers no further value or when the work packages can be realistically estimated and they have a meaningful conclusion.



- For a completely decomposed project, each work package should:
  - Have a single purpose
  - Be decomposed until it does not make sense to decompose further
  - Be estimable with a high degree of accuracy
  - Contain clearly understood deliverable(s) or work product(s)

Key Terms

Work Breakdown Structure

A hierarchical decomposition of the total scope of work to be carried out by the project team to accomplish the project objectives and create the required deliverables

WBS Dictionary

A document that provides detailed deliverable, activity, and schedule information about each component in the Work Breakdown Structure

Project Scope Statement

The project scope statement is the description of the project scope, major deliverables, assumptions, and constraints. It describes the project's deliverables in detail.

Control Account

A management control point where scope, budget, actual cost, and schedule are integrated and compared to earned value for performance measurement

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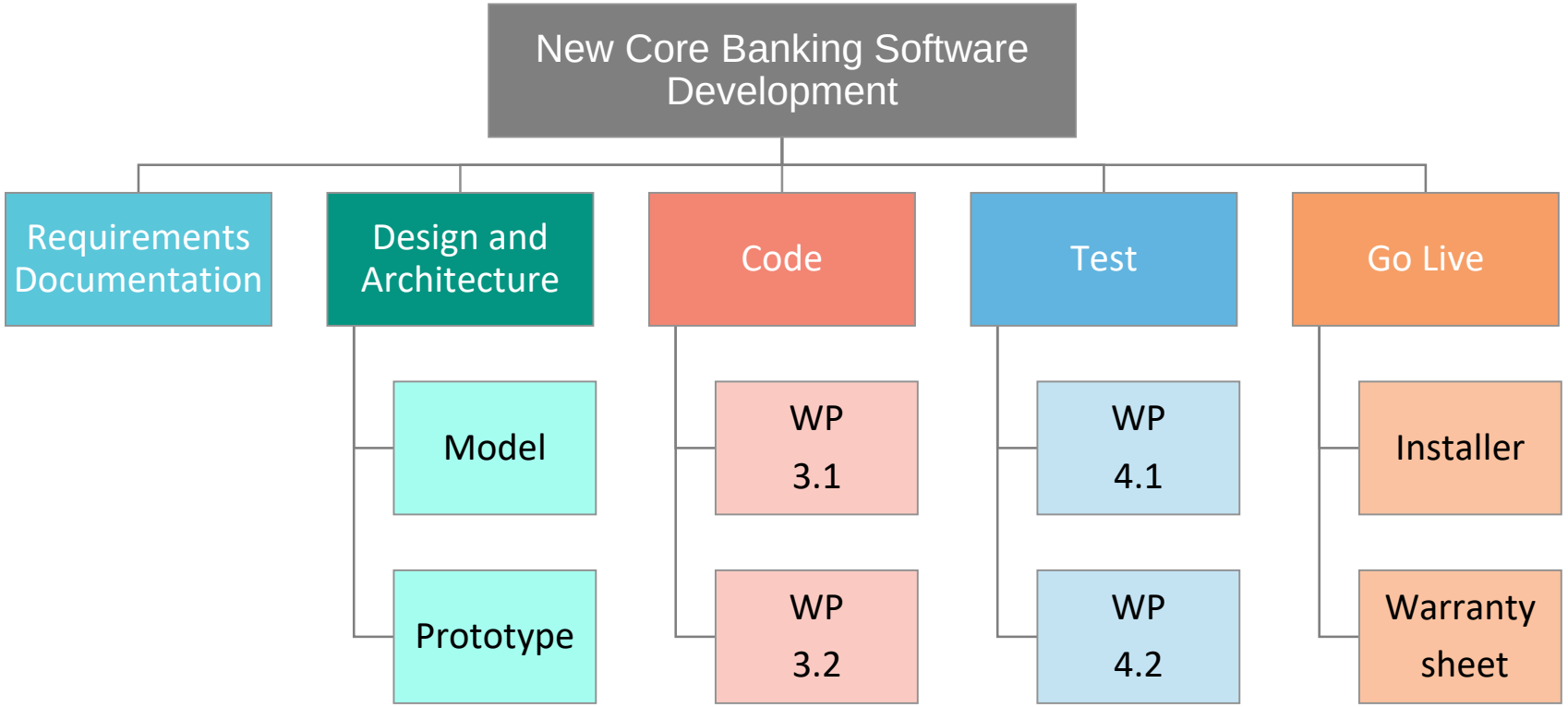
WBS: Example

Given below is the WBS of a core banking software development project:



Project Scope Management Processes

Knowledge Areas		Project Integration Management	Project Scope Management	Project Schedule Management	Project Cost Management	Project Quality Management	Project Resource Management	Project Communications Management	Project Risk Management	Project Procurement Management	Project Stakeholder Management
Project Management Process Groups	Initiating	4.1 Develop Project Charter									13.1 Identify Stakeholders
	Planning	4.2 Develop Project Management Plan	5.1 Plan Scope 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS	6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Durations 6.5 Develop Schedule	7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget	8.1 Plan Quality Management	9.1 Plan Resource Management 9.2 Estimate Activity Resources	10.1 Plan Communications Management	11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Response	12.1 Plan Procurement Management	13.2 Plan Stakeholder Engagement
	Executing	4.3 Direct and Manage Project Work 4.4 Manage Project Knowledge				8.2 Manage Quality	9.3 Acquire Resources 9.4 Develop Team 9.5 Manage Team	10.2 Manage Communications	11.6 Implement Risk Response	12.2 Conduct Procurements	13.3 Manage Stakeholder Engagement
	Monitoring and Controlling	4.5 Monitor and Control Project Work 4.6 Perform Integrated Change Control	5.5 Validate Scope 5.6 Control Scope	6.6 Control Schedule	7.4 Control Costs	8.3 Control Quality	9.6 Control Resource	10.3 Monitor Communications	11.7 Monitor Risks	12.3 Control Procurements	13.4 Monitor Stakeholder Engagements
	Closing	4.7 Close Project or Phase									

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Plan Scope Management

"Plan Scope Management is the process of creating a scope management plan that documents how the project scope will be defined, validated, and controlled." It belongs to the Planning Process Group.

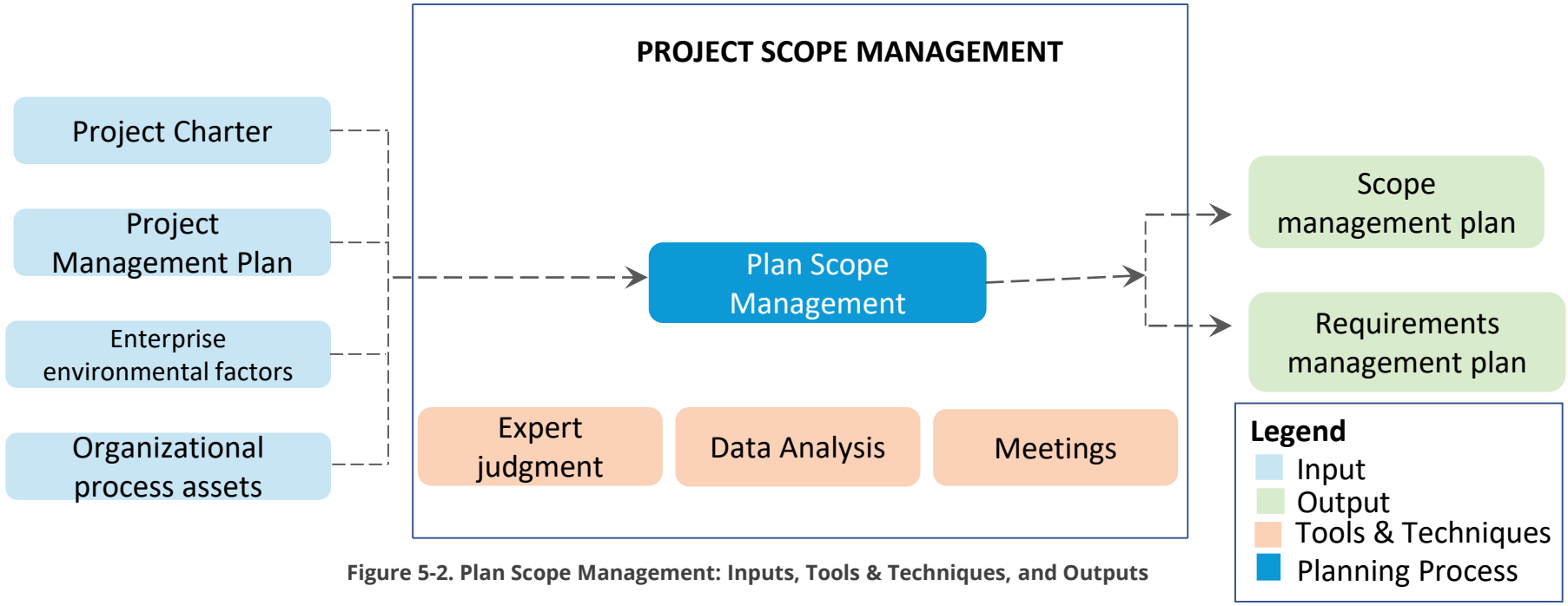

Figure 5-2. Plan Scope Management: Inputs, Tools & Techniques, and Outputs

Understand the inputs and tools and techniques of scope management to answer concept-based questions.

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Collect Requirements

"Collect Requirements is the process of determining, documenting, and managing stakeholder's needs and requirements to meet objectives." It belongs to the Planning Process Group.

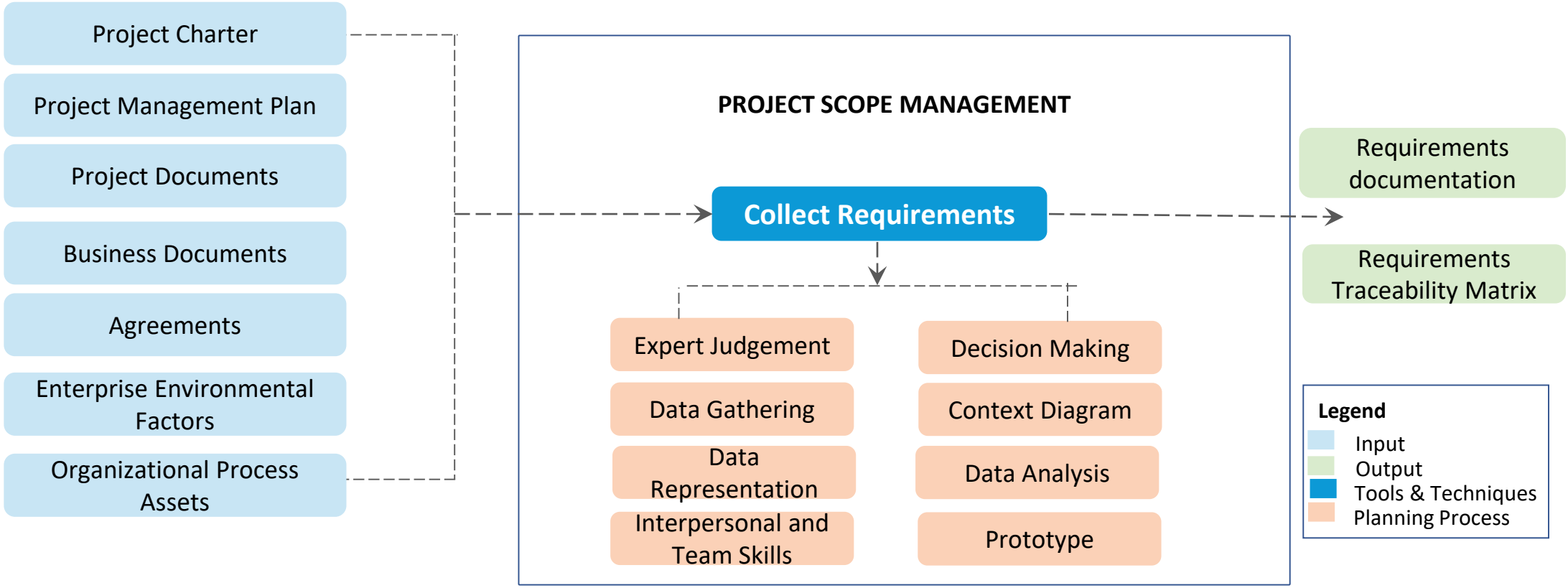

Figure 5-4. Collect Requirements: Inputs, Tools & Techniques, and Outputs9

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Business Scenario: Problem Statement

- Gina is a project manager with Bluedot Software Development and Web Design Company.
- A large, global customer contracts the company to design software that would allow them to capture service requests from thousands of potential clients, track existing client projects, and facilitate communication between them and their clients.
- Gina has never led a project of this size, but has successfully completed a similar project on a smaller scale. Therefore, Gina feels confident about her abilities to lead the project and will utilize historical information from her previous project to plan for this initiative.
- During the planning process, Gina and her team conduct interviews and surveys and facilitate workshops to collect the necessary requirements needed to complete the project scope of work. They use these requirements to design and build the software system.
- Unfortunately, during the final user acceptance testing of the software, which is required for customer sign-off, Gina's project team discovers the software design will not support the performance requirements when the system is under the load of several hundred users. What happens now?

Business Scenario: Solution

- This is a major blow to Gina and her team. They had captured the customer requirements accurately but had not anticipated how to support the non-functional requirements for load and performance of the system.
- With this being a software design issue, the team has to rewrite the core architecture of the software, which requires all components of the systems to be retested before customer sign-off.
- Because of the team's inability to adequately define the requirements without cutting corners, the rework impacts Gina's project in several ways:
  - Increased cost
  - High risk of customer dissatisfaction
  - Missed schedule deadlines
  - Low morale of project team members
- The project needs to assess the impact and likely requires a Change Request for schedule and budget impacts.

Group Creativity Techniques

Requirements gathering has several techniques to ensure a solid understanding of the functionality of the project.

Group creativity techniques are used to channel a group's combined brainpower to solve a problem, identify requirements or risks, or make a decision.

1

Brainstorming

It is used to generate and collect multiple ideas related to project and product requirements. It is not an evaluation technique but an ideation process.

2

Nominal Group Technique

It enhances brainstorming with a voting process used to rank the most useful ideas for further brainstorming or prioritization.

3

Idea or Mind Mapping

It consolidates ideas created through individual brainstorming sessions into a single map to reflect commonality and differences in understanding and to generate new ideas.

4

Affinity Diagram

It allows large number of ideas to be classified into groups for review and analysis.

5

Multi-criteria Decision Analysis

It is a technique that uses a decision matrix to provide a systematic analytical approach for establishing criteria, such as risk levels, uncertainty, and valuation, to evaluate and rank ideas.

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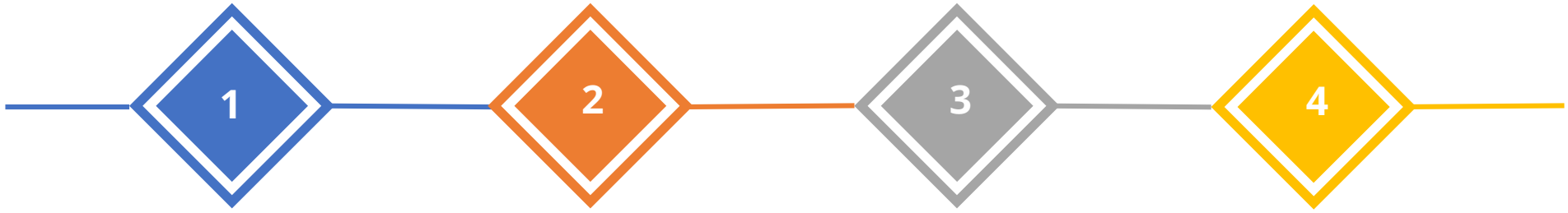
Group Decision-making Techniques

Group decision-making techniques are used to arrive at decisions when a number of people are involved in the decision-making process.

Some of the techniques used are as follows:



Unanimity

It is a decision that is reached whereby everyone agrees on a single course of action. This can be achieved using Delphi method.

Majority

It is a decision that is reached with support from more than 50% of the members of the group.

Plurality

It is a decision that is reached whereby the largest block in a group decides, even if a majority is not achieved.

Autocratic

Decisions are made by an individual on behalf of the group.

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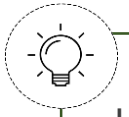
Requirement Traceability Matrix

A sample requirements traceability matrix is given below:

Requirement Number	Design	Coding	System Testing	Acceptance Testing
3.1.1.1 (Multi-user access)	SDD Section 3.1	RBACprocessing.cpp SchemaCreation.sql	Tests 111-120	Tests 51-55
...				
...				
...				
...				



Requirements Traceability is a technique used to verify that the work packages of a WBS are delivered and tested. Typically, this is supported through tooling like Microsoft Team Foundation Server or similar products.

Define Scope

"Define Scope is the process of developing a detailed description of the project and product." It belongs to the Planning Process Group.

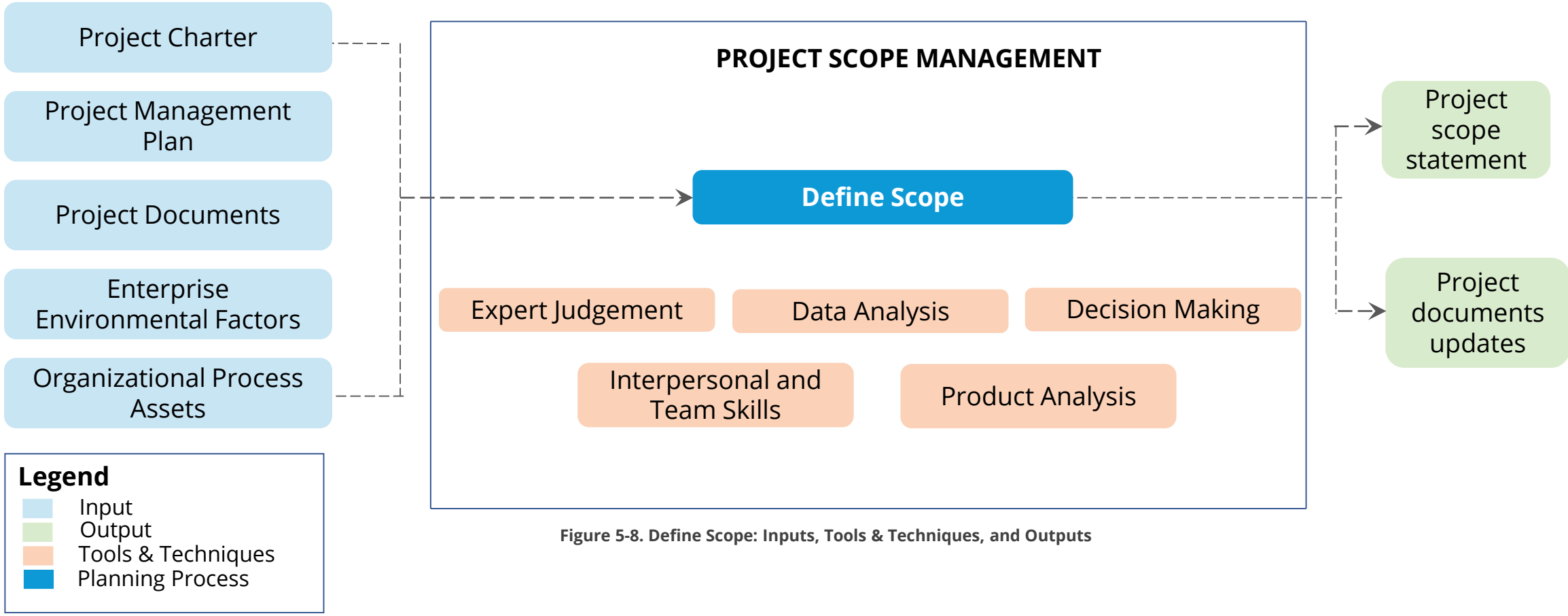


Figure 5-8. Define Scope: Inputs, Tools & Techniques, and Outputs

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Create WBS

"Create WBS is the process of subdividing project deliverables and project work into smaller, more manageable components." It belongs to the Planning Process Group.

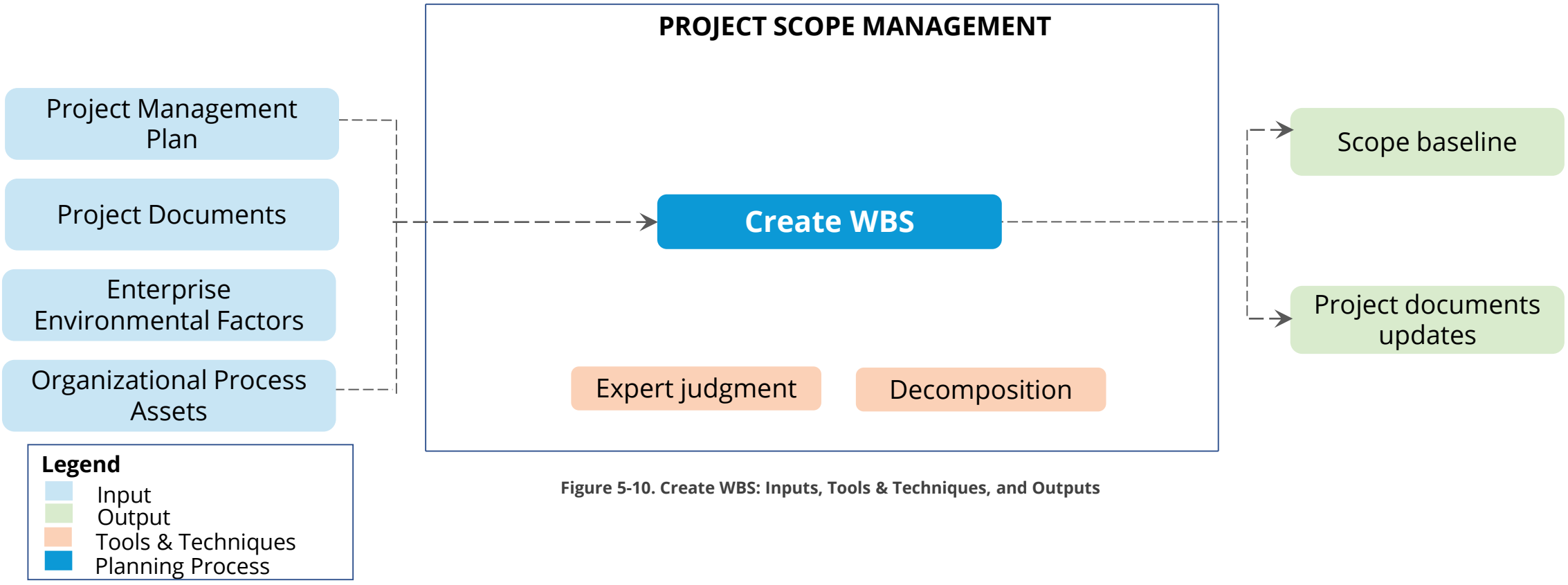

Figure 5-10. Create WBS: Inputs, Tools & Techniques, and Outputs

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Validate Scope

"Validate Scope is the process of formalizing acceptance of the completed project deliverables." It belongs to the Monitoring and Controlling Process Group.

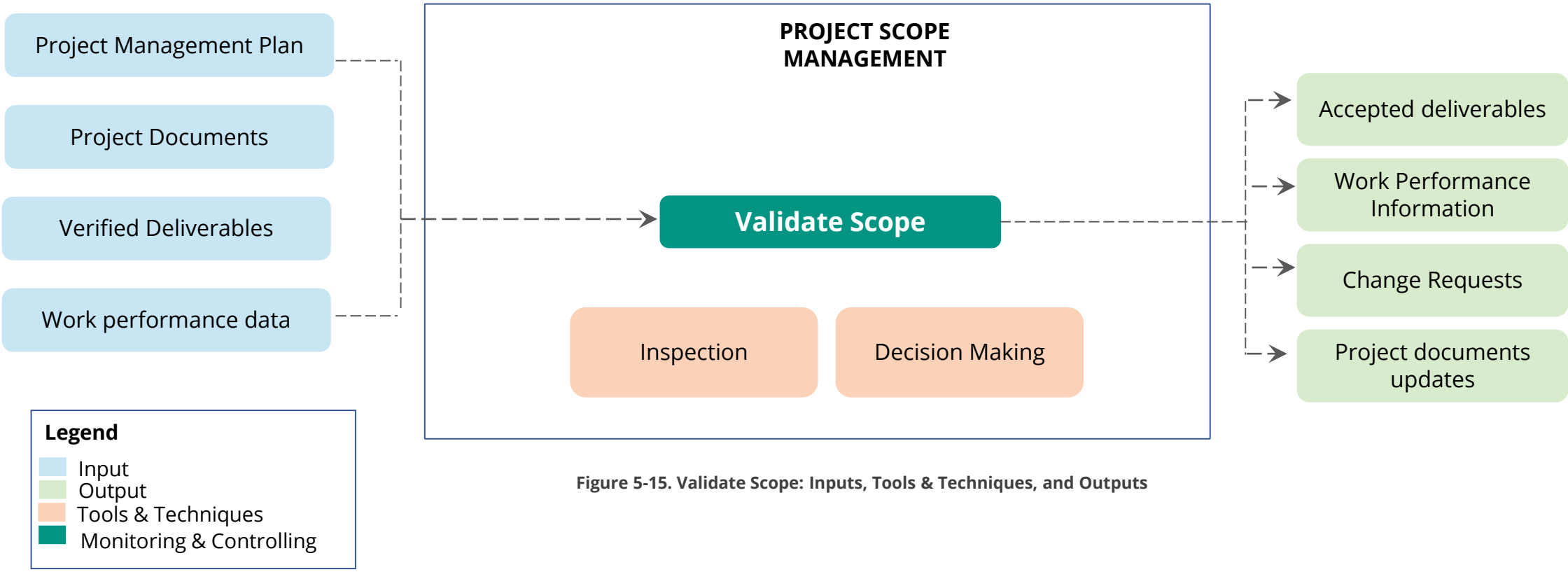

Figure 5-15. Validate Scope: Inputs, Tools & Techniques, and Outputs

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Control Scope

"Control Scope is the process of monitoring the status of the project and product scope and managing changes to the scope baseline." It belongs to the Monitoring and Controlling Process Group.

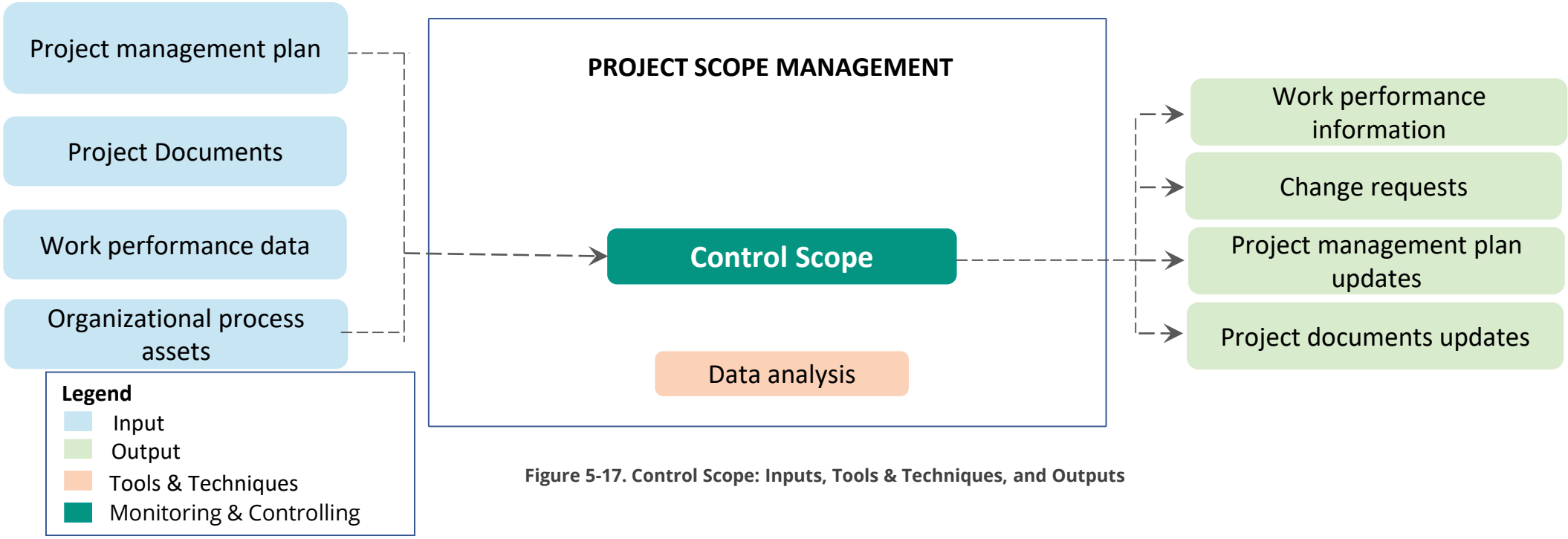

Figure 5-17. Control Scope: Inputs, Tools & Techniques, and Outputs

Understand the creation of WBS to answer concept-based questions.

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Important Outputs

Given below are important outputs from Project Scope Management:

Work Performance Information

The performance data collected from controlling processes, analysed in comparison with project management plan components, project documents and other work performance information. Work performance data becomes work performance information after the tools and techniques of a process have been applied.

Accepted Deliverables

These are deliverables that have been verified and are ready for validation against the project scope at which point they are accepted.

Change Requests

When validating project scope, new requirements might be discovered, for example, adding an email notification when a password is changed. These requirements should be documented as change requests.

Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute, Inc., 2017, Glossary

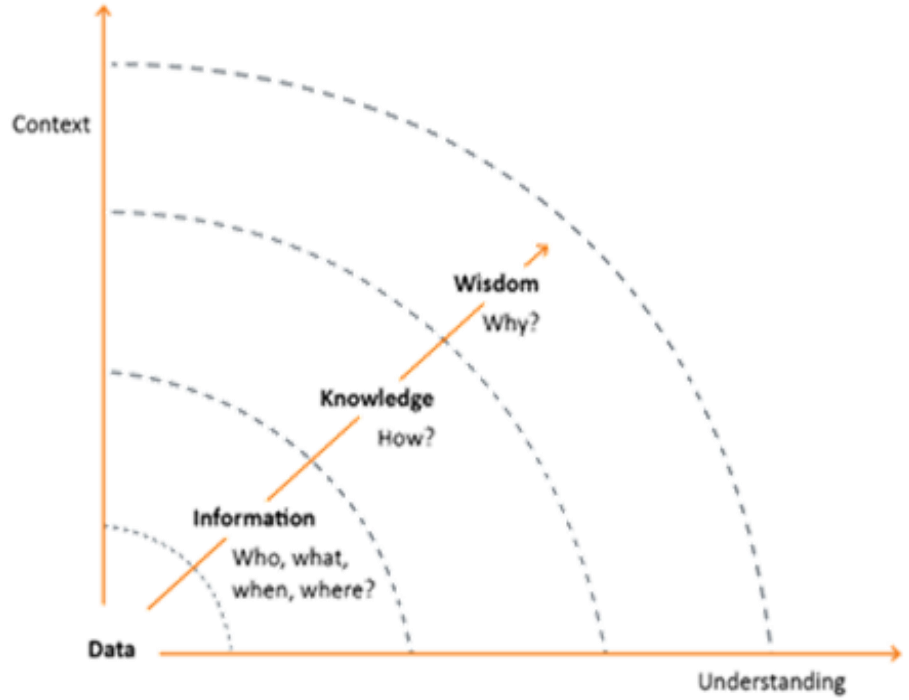
Data–Information–Knowledge–Wisdom

The PMI emphasizes managing project knowledge as an important technique throughout all processes. Existing knowledge and new knowledge are represented as Project Performance Data, which acts as an input to a process and, in turn, produces an output of Project Performance Information.

Data-Information-Knowledge-Wisdom (DIKW) is the heart of knowledge management. Effective sharing of knowledge requires the development and maintenance of data.

Some facts related to DIKW are:

- Data is a set of discrete facts
- Information requires applying meaning or relevance to the set of facts



Business Scenario: Problem Statement

- Brian, the project manager in a strong-matrix organization, has been leading projects for his company for 10 years.
- The company has made a decision to streamline their operations and create policies and procedures to cultivate a culture that is more centered on driving customer excellence. This shift in mindset is slowly being adapted by company leaders and staff members.
- Brian's current project is 25% complete, ahead of schedule, and currently under budget.
- Every two weeks, Brian schedules meeting with key stakeholders to review the project reports and metrics.
- During the last stakeholder meeting, Brian was asked by one of the key stakeholders to add a new feature to the scope of work in the form of a formal change request.
- This stakeholder has just returned from an industry conference where he gained insight on some advanced technology that would increase the company's competitive position and result in a large increase in market share. How should Brian handle this change request?

Business Scenario: Solution

- As this was a formal request by a key stakeholder, Brian should follow the agreed upon Change Request process.
- This would include analyzing the costs and benefits of the proposed request and providing alternatives to minimize the impact to cost and schedule.
- Once this analysis is complete, Brian can present his findings to the Sponsor and Stakeholders for their decision.