PROJECT MANAGEMENT

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PMP® Certification Training

Lesson 05: Project Integration Management

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PROJECT MANAGEMENT

Objectives

- Define Project Integration Management
- Identify the key role of the project manager, project team, and project sponsor
- Explain various project selection methods
- Describe the Project Integration Management processes
- Identify key terminologies used in Project Integration Management

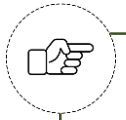
Project Integration Management

The Project Integration Management includes:

Processes and Activities to identify, define, combine, unify, and coordinate the various processes and project management activities

Project Integration Management is high-level work that requires the project manager to manage interdependencies among the other Knowledge Areas. It deals with:

- Resource allocation
- Balancing complex demands
- Examining alternatives
- Tailoring processes to work within organization and project needs
- Managing the interdependencies among Project Management Knowledge Areas



Integration management ensures continuity across multiple knowledge areas.

Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute, Inc., 2017, Page 69

Project Integration Management

Projects are iterative in nature with links among processes requiring integration to:

- Ensure deliverables and due dates are achieved
- Provide a plan for managing the project
- Ensure proper knowledge is used/available to the effort when needed
- Manage performance of effort
- Constrain change to project
- Integrate decision-making across knowledge and process groups
- Identify and collect work performance
- Monitor and control work performance
- Implement risk strategies across efforts when indicated by events or performance
- Manage communications and engagements
- Effectively manage phase transitions

Role of Project Manager, Team, and Sponsor

Given below are the key roles of the project manager, project team, and the project sponsor:

 Project Manager	The key role of a project manager is to integrate various activities of the project.
 Project Team	The key role of a project team is to concentrate on completing the project activities.
 Project Sponsor	The key role of a project sponsor is to protect the project team from unnecessary changes and loss of resources.

Project Selection Methods

An organization can undertake a project as a contract or driven by business needs. There should be a formal process for selecting projects to ensure that the limited corporate resources are optimized.

The two broad project selection methods are as follows:

Benefit measurement methods

These methods ascertain the costs and benefits of undertaking the project.

Examples:

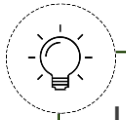
- Murder board
- Peer review
- Scoring models
- Economic models
- Benefit compared to cost

Constrained optimization methods

These methods rely on mathematical modeling techniques to determine the selection of the best projects to achieve certain business objectives.

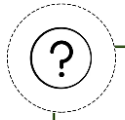
Examples:

- Linear programming
- Goal Programming
- Integer Programming



Understand the characteristics of various project selection methods to answer scenario based questions.

Project Selection Methods (Contd.)

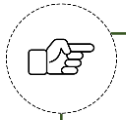


What type of project selection technique is peer review?

Peer review is a benefit measurement method.

Present Value (PV)

Present Value (PV) is the current value of a future cash flow. The amount of money received today is worth more than the same amount in the future. A discount factor has to be applied to reflect future cash flows in present values.



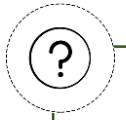
A sum of $250 being paid right now will be more valuable than $250 being paid 3 years from now.

PV analysis is important to ensure that an organization maximizes its profit, particularly when value will be delivered a long time in the future.

Farther the timing of the cash flow (future value), lower is the present value.

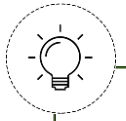
Net Present Value (NPV)

Net Present Value (NPV) is the difference between value of the total benefits (income or revenue) and the costs over a period of time. Present values of different items combined gives the NPV.



Project X will take 2 years to complete and has an NPV of $35,000. Project Y will take 5 years to complete and has an NPV of $95,000. Which project would you select?

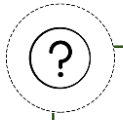
Project Y, because it has a higher NPV
Note: The project with the higher NPV is better



Problems where a project has to be selected over other projects on the basis of its net present value can be expected in the exam.

Internal Rate of Return (IRR)

Internal Rate of Return (IRR) is the rate of discounting (used to reduce future cash flows to their present value) at which the present value of costs match the present value of benefits. In other words, it is the rate of return internal to the project.



Project A has an IRR of 25% and project B has an IRR of 15%. which project would you choose?

Project A, because it has a higher IRR

The project with the higher IRR is better.

Payback Period

Payback Period is the number of time periods it takes to recover the investment from the project before profits start accumulating.

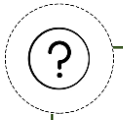
Project A has a payback period of 5 months and project B has a payback period of 12 months. Which project would you select?

Project A, because it has a lesser payback period

The project with the lesser payback period is better.

Benefit Cost Ratio (BCR)

Benefit Cost Ratio (BCR) compares the present value of benefits to the present value of costs. A benefit cost ratio of more than 1 means that the benefits are greater than the costs.



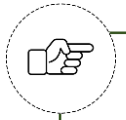
Which project would you select if the BCR of Project A is 2.5 and BCR of Project B is 1.5?

Project A, as it has higher BCR

Accept a project with a BCR greater than 1. The project with the higher BCR is better.

Return on Investment (ROI)

Return on Investment (RoI) is the rate of return on the project normalized by the initial investment. It indicates the profitability of the project.



If a project involves an initial investment of $100,000 and generates an average return of $20,000 per year, ROI is 20,000/100,000 or 20%.

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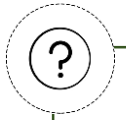
Higher the ROI, the more profitable the project is.

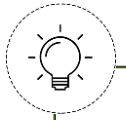
Opportunity Cost

Opportunity cost is the cost related to the next best choice available after choosing from among several mutually exclusive choices. It is therefore the opportunity given up by selecting one project over another.



What is the opportunity cost of selecting Project B if Project A has an NPV of $55,000 and Project B has an NPV of $85,000?

Opportunity cost is $55,000. This is the NPV of Project A.



Problems where a project has to be selected over other projects on the basis of net present value and opportunity cost can be expected in the exam.

Project Integration Management Knowledge Areas

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 ManTemenl 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									

Table 1-4. Project Management Process Group and Knowledge Area Mapping

Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute, Inc., 2017, Page 25

Develop Project Charter

Develop Project Charter is a process of developing a document that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to the project activities.[1] It belongs to the Initiating Process Group.

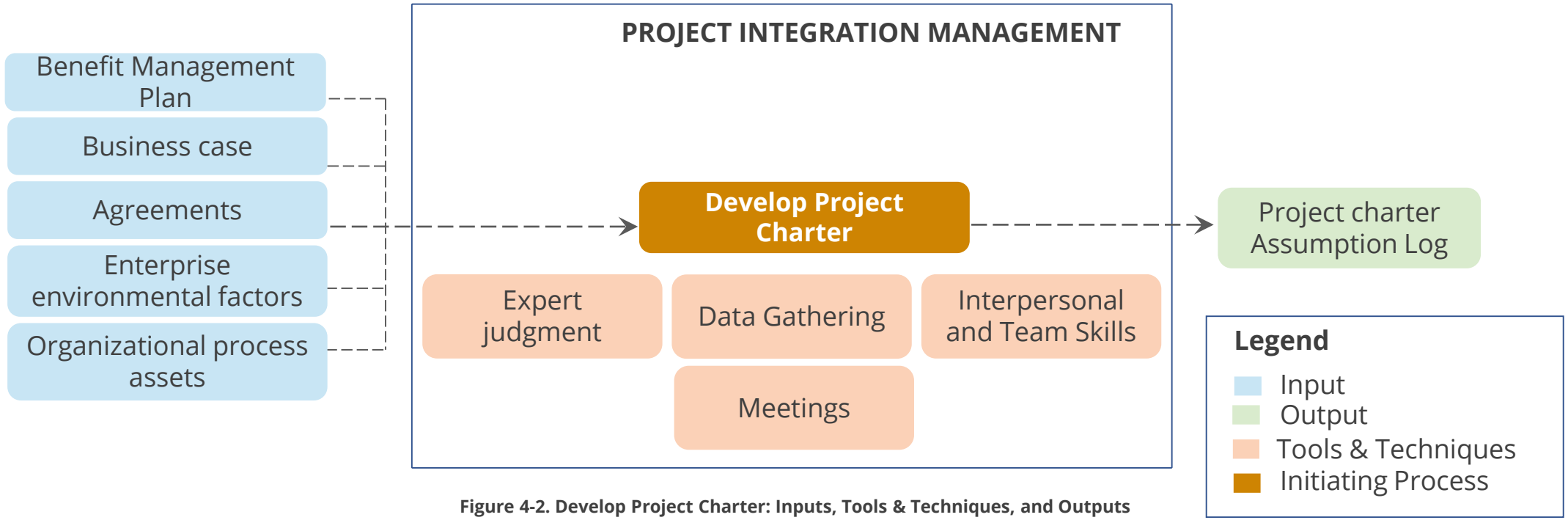


Figure 4-2. Develop Project Charter: Inputs, Tools & Techniques, and Outputs

Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute, Inc., 2017, Page 75

Develop Project Charter

This process if the first opportunity for Project Manager to understand the vision and goals of the project as agreed to by the sponsor and stakeholders.

- Describes project purpose, vision, and initial scope
- Formally authorizes project and project manager
- Contains
  - Business problem to be solved
  - Measurable project objectives/requirements
  - Project boundaries and key deliverables
  - Risks
  - Critical success factors
  - Stakeholder list and roles/responsibilities
  - Constraints and assumptions
  - Project exit criteria
- Approved by project sponsor

Initial Scope Statement

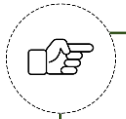
Defining the initial scope statement is the first step in the Project Management Process

- What problem or opportunity is to be addressed?
- What are the project goals and objectives?
- What are the project work activities to be performed
- What will success look like?
- How will success be measured?
- What risks or obstacles may affect the outcome?
- What roles and responsibilities will be assigned in the effort?
- What constraints, assumptions, and unanswered questions are impacting the vision?
- What is the cost/benefit and/or Return on Investment (ROI) analysis?
- How is Internal Rate of Return (IRR) estimated?
- What are the project resource requirements and constraints - time, budget, HR, physical assets, etc.?

Develop Project Management Plan

Develop Project Management Plan is the process of defining, preparing, integrating, and coordinating all subsidiary plans and integrating them into a comprehensive project management plan.[2]

- Project management plan is a detailed document that describes how the project would be executed, monitored and controlled, and closed.
- Project management plan contains all the subsidiary plans and their baseline values. Performance measurement baseline of project's time is the total of project baseline time and the agreed time variance.
- Subsidiary plans can be separate documents, particularly on very large projects.



If the initial agreed time for a project is 180 days, it is the project baseline time value. If the agreed variance is 10%, the project should be executed in maximum 180+180*10% = 180+18 = 198 days.

Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute, Inc., 2017, Page 82

Contents of Develop Project Management Plan

Regardless of how the plan is organized, it should contain a section referencing or covering:

- Project Charter
- Project management approach or strategy
- Scope Management Plan
- Requirements Management Plan
- Schedule Management Plan
- Cost Management Plan
- Quality Management Plan
- Resource Management Plan
- Communications Management Plan
- Risk Management Plan
- Procurement Management Plan
- Stakeholder Engagement Plan
- Change Management Plan
- Configuration Management Plan
- Scope Baseline
- Schedule Baseline
- Cost Baseline
- Performance Measurement Baseline
- Project Life-cycle Description
- Development Approach

Develop Project Management Plan: Process Flow

The various inputs, outputs, and tools and techniques of developing the project plan are given below.

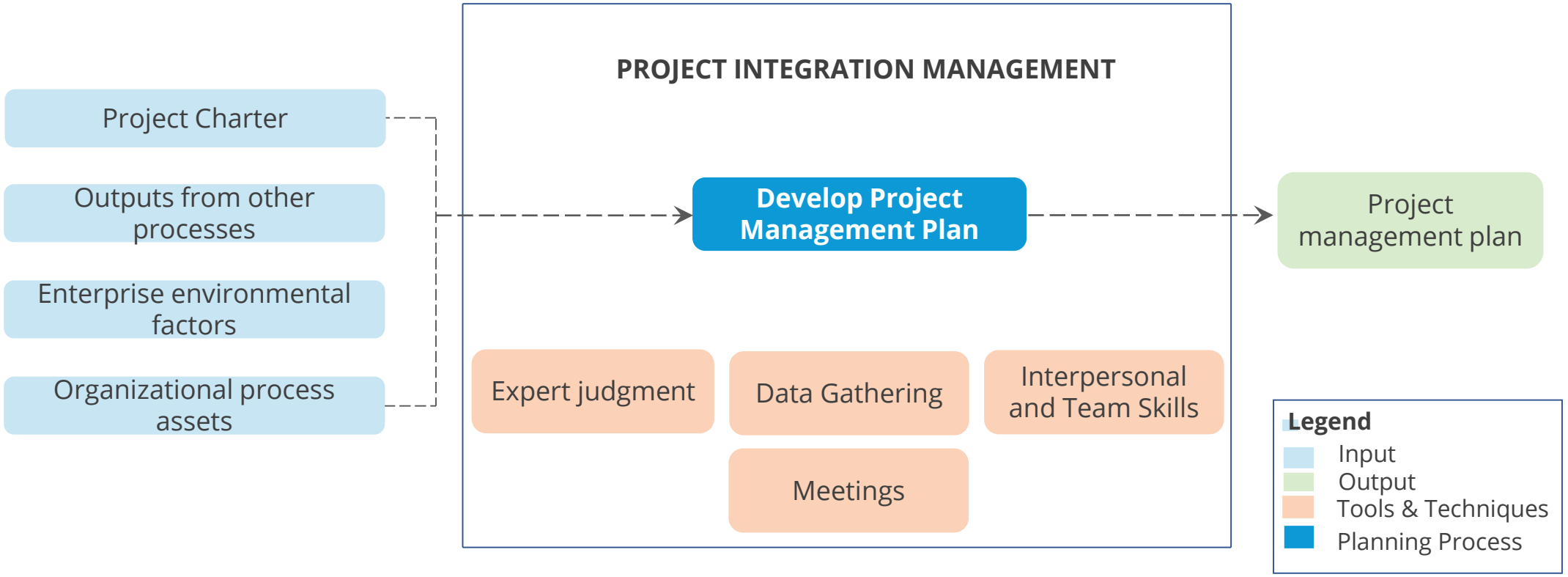


Figure 4-4. Develop Project Management Plan: Inputs, Tools & Techniques, and Outputs

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Key Terms

The following key terms are essential to understand project management processes:

*Work Authorization System

A subsystem of the overall project management system, that is, a collection of formal documented procedures that defines how project work will be authorized [3]

*Corrective Action

An intentional activity that realigns the performance of the project work with the project management plan

*Preventive Action

An intentional activity that ensures the future performance of the project work is aligned with the project management plan [3]

*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 38, 96.

Key Terms (Contd.)

The following key terms are essential to understand project management processes:

*Change Control System

A set of procedures that describes how modifications to the project deliverables and documentation are managed and controlled

*Configuration Management System

A set of procedures used to apply technical and administrative direction and surveillance to identify and document the functional and physical characteristics of a product, service or result, or component

*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 41.

Direct and Manage Project Work

Direct and Manage Project Work is the process of leading and performing the work defined in the project management plan to achieve the project objectives. It belongs to the Executing Process Group.

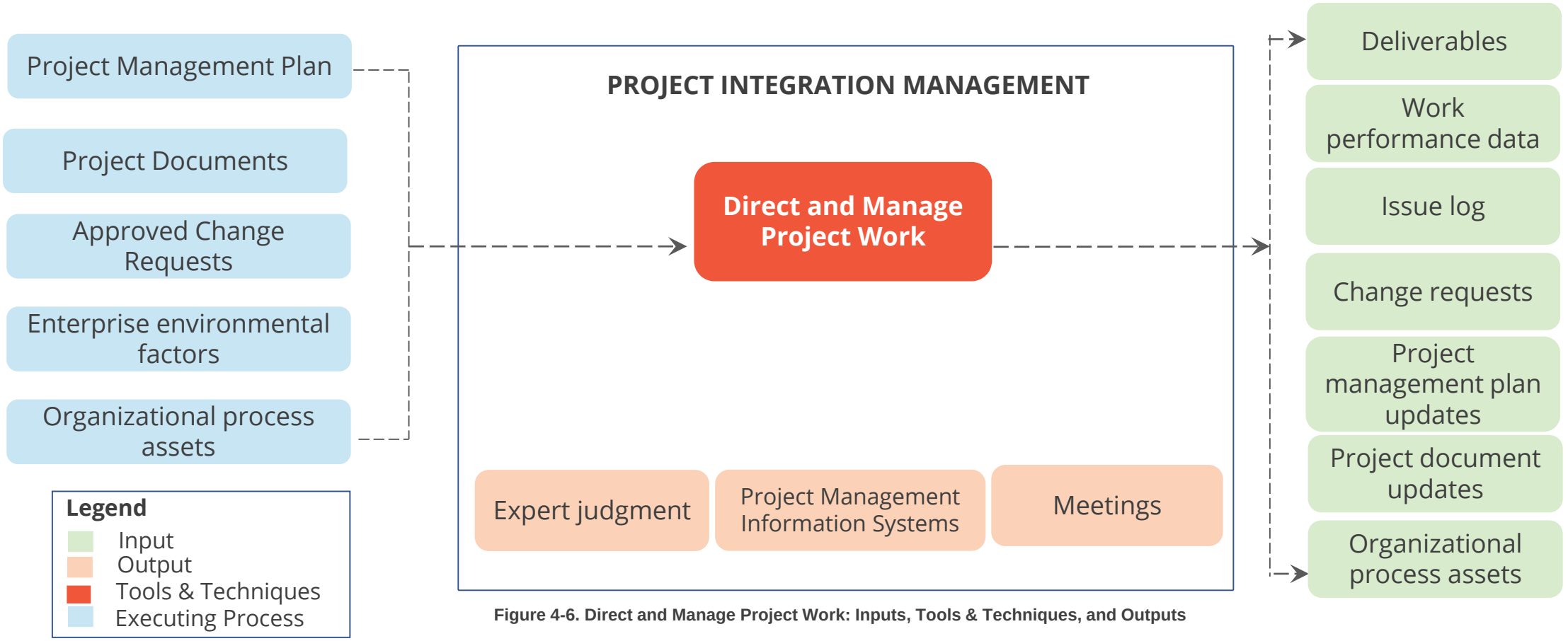

Figure 4-6. Direct and Manage Project Work: Inputs, Tools & Techniques, and Outputs

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Direct and Manage Project Work (Contd.)

During Direct and Manage, the Project Manager focuses on:

- Project Team development and coordination
  - Ensure appropriate training, reference material, availability of experts
  - Coordinate efforts within team
  - Resolve conflicts and issues with internal/external groups or contractors
  - 5 minute meetings
- Interfacing with all stakeholders
  - Following Communication plan
  - Following Stakeholder Engagement plan
  - Reporting metrics
  - Reporting progress
  - Additional reporting requirements as defined in the Communication plan

Direct and Manage Project Work (Contd.)

During Direct and Manage, the Project Manager focuses on:

- Project Plan Monitoring (actual vs. planned)
  - Gathering actual completion dates
  - Determining task completion status
- Overall quality management
  - Quality in all deliverables
  - Compliance with process
- Risk management
  - Identifying risks
  - Implementing mitigation strategies
  - Communicating risks
- Scope & product change management
  - Implement the process
  - Look for unauthorized changes
  - Ensure scheduled changes are incorporated and completed

Direct and Manage Project Work (Contd.)

During Direct and Manage, the Project Manager focuses on:

- Facilitating project meetings & performance reviews (communications management)
  - Follow Communication plan
  - Execute Stakeholder Engagement Management Plan
  - Document inputs from meetings and communications with stakeholders and team members
- Documenting progress and work performance
- Updating project records, reports (communications management), and deliverables management

Execution

During Execution, Project Leadership is a critical success factor.

The PM must lead the Project Team & stakeholders with respect to the project.

- Essential prerequisite for project success is the PM's ability to lead the Project Team in what can be an unstructured environment.
- Provide leadership throughout each phase of the project to motivate team members, ensure consistent interpretation of the requirements, keep the project on schedule and within budget, and make sure all milestones (e.g., deliverables submissions) are met.

Leadership roles & skills:

- Planning
- Organizing
- Coordinating
- Motivating (team building)
- Controlling
- Directing

Manage Project Knowledge

Manage Project Knowledge is the process of using existing knowledge to create new knowledge to achieve project objectives and to contribute to the organizational knowledge base for future efforts.

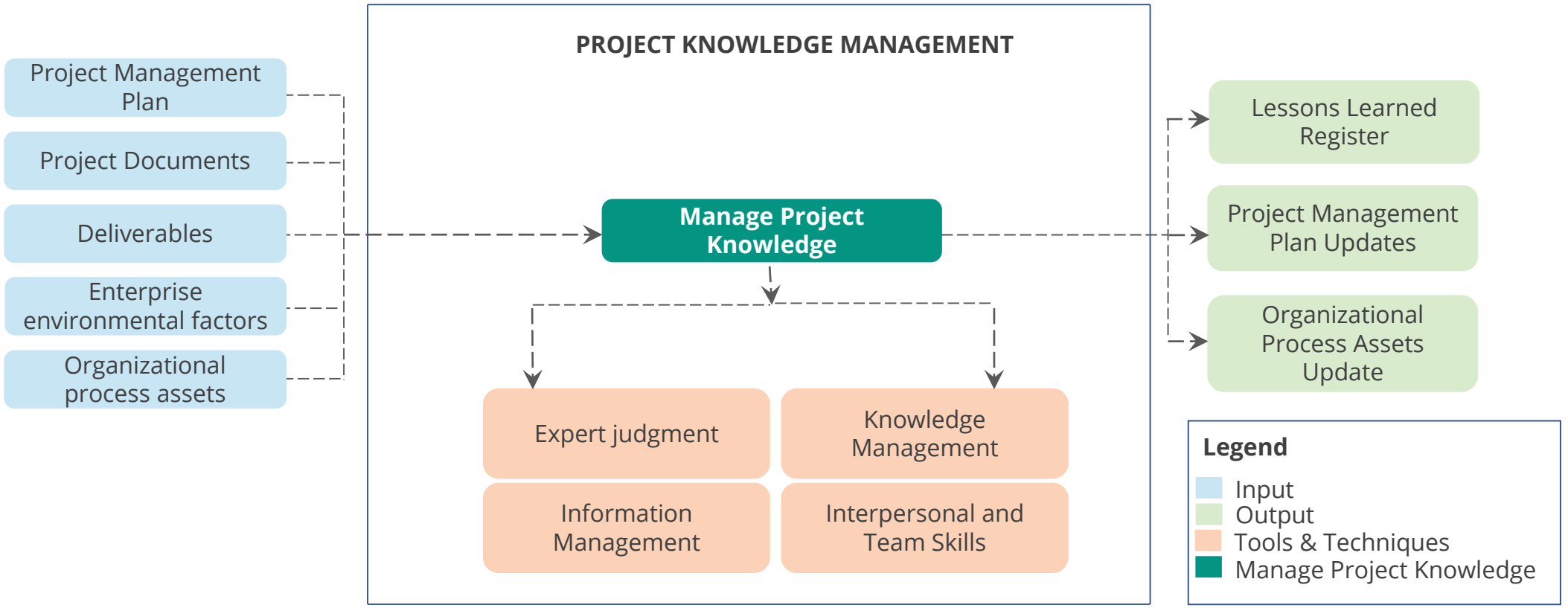

Figure 4-8. Manage Project Knowledge: Inputs, Tools & Techniques, and Outputs

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Manage Project Knowledge

Project knowledge is broken into explicit and tacit knowledge and is intended to increase organizational success factors as well as achieve project objectives.

- Explicit knowledge is information that can be easily documented and communicated
- Tacit knowledge is personal and difficult to communicate (expertise, experience, insights, etc.)
- Both types of knowledge are required for Project Knowledge
- Ensure that tacit and explicit knowledge are used before, during, and after project development
- Knowledge Management is more than lessons learned, change requests, and risks

Monitor and Control Project Work

Monitor and Control Project Work is the process of tracking, reviewing, and regulating the progress to meet the performance objective(s) defined in the project management plan. It belongs to the Monitoring and Controlling Process Group.

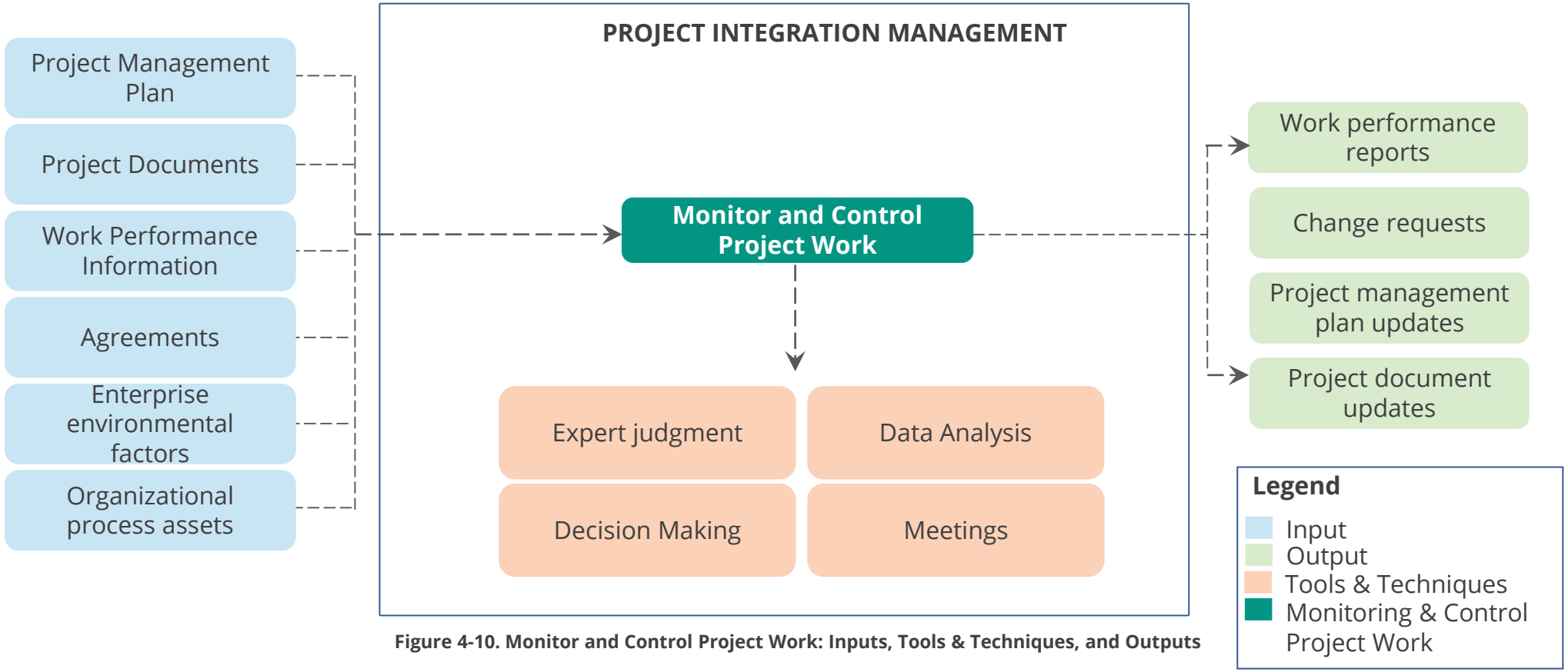


Figure 4-10. Monitor and Control Project Work: Inputs, Tools & Techniques, and Outputs

Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute, Inc., 2017, Page 105

Monitor and Control Project Work (Contd.)

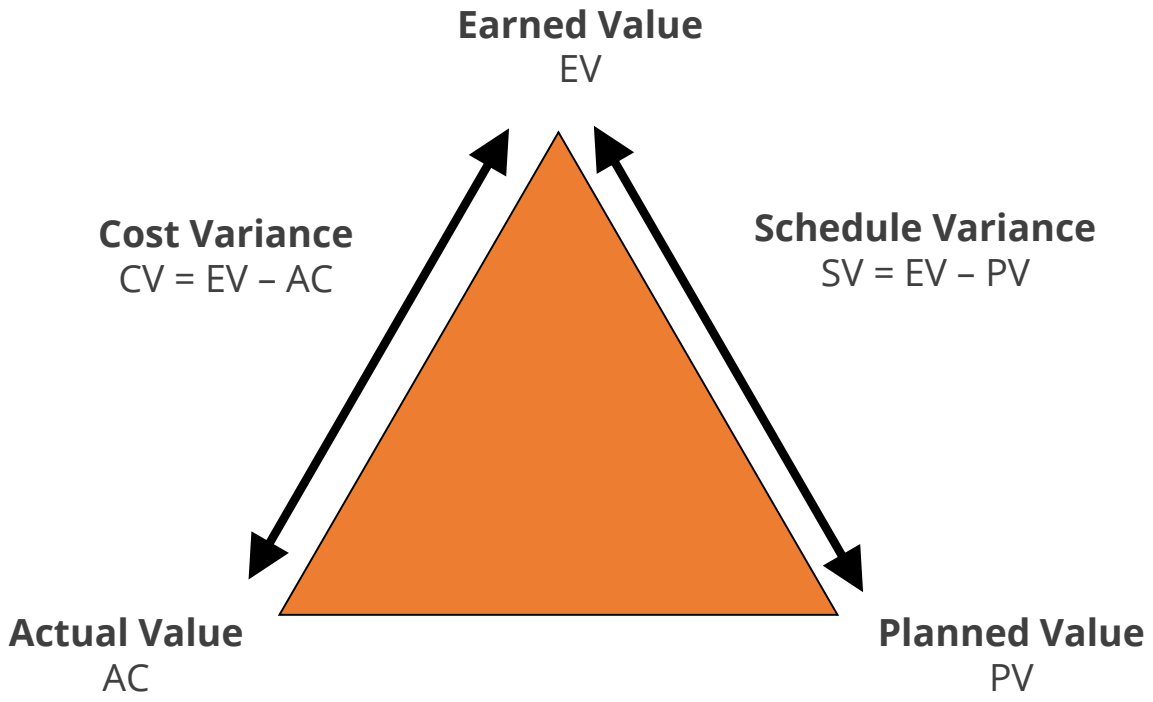
During Monitor and Control Project Work, the Project Manager focuses on:

- Evaluating work performance
- Developing Variance analysis
    - Monitor metrics and evaluate and report on variance
    - Evaluate for impact and correct if necessary
    - Evaluate trending work performance and project status and look for indicators in project variables
- Earned value management
    - Overlap with Control and Monitoring process
    - Collect information to develop analysis model
    - Communicate results of model throughout the team
    - Make decisions to improve performance, burn-rate, or both
    - Evaluate staffing decisions for performance

Monitor and Control Project Work: Challenges

Project Mangers must manage both cost and schedule

- "Poor cost variance combined with good schedule variance does not mean everything is alright" – Humphreys 2002
- Spend more and make up time (SV decrease)
- Spend less and lose time (CV decrease)



Monitor and Control : Lesson Learned

The monitor and control project work is an opportunity to adjust and adapt the work to ensure project success. It is also an opportunity to learn new approaches and techniques that other projects can benefit from. This process:

- Generates real-time Lessons Learned for current and future efforts
- Defines additional approaches for future efforts
- May result in schedule modifications
    - Corrective / Preventative Actions
    - Fast-track schedule
    - Schedule Optimization
    - Implementation of mitigation plans

Perform Integrated Change Control

Perform Integrated Change Control is the process of reviewing all change requests; approving and managing changes to the project deliverables, project documents, and the project management plan; and communicating the decisions. It belongs to the Monitoring and Controlling Process Group.

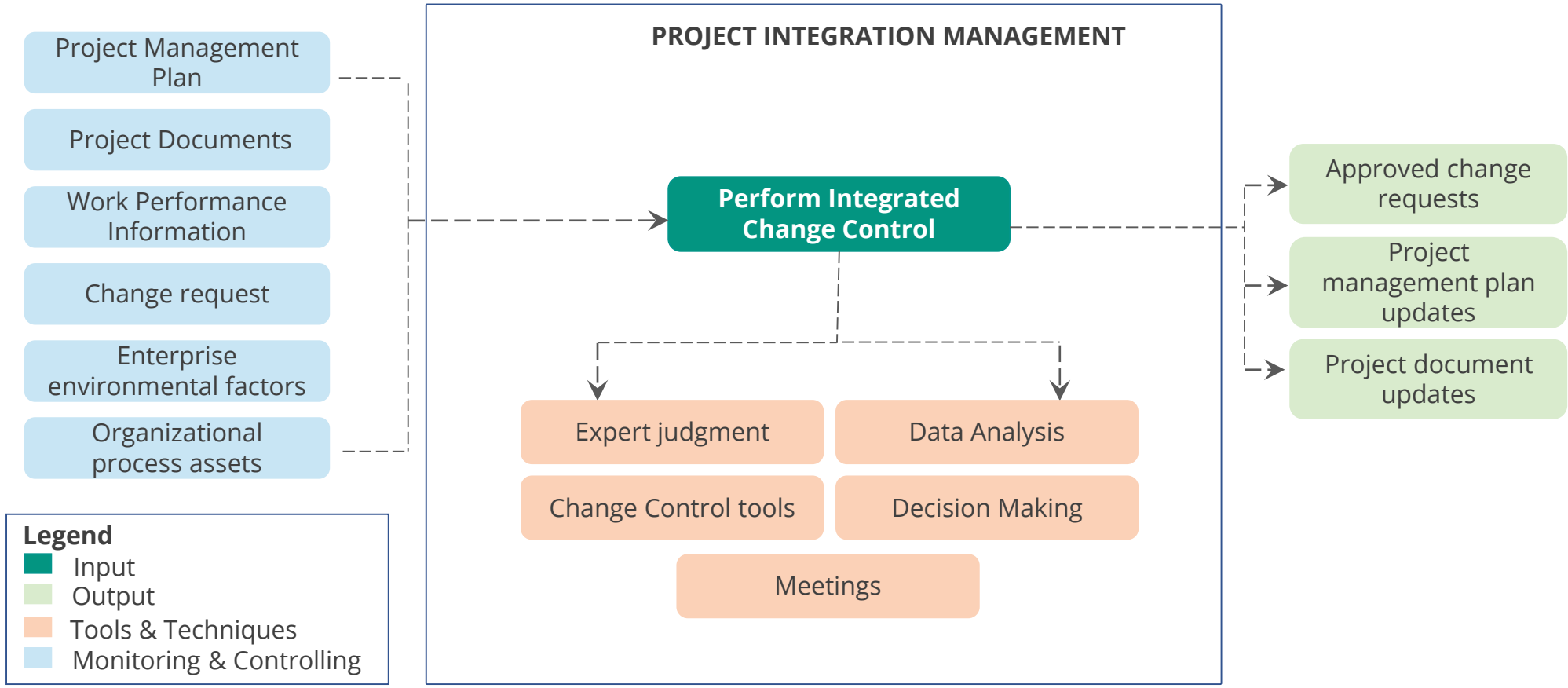


Figure 4-12. Perform Integrated Change Control: Inputs, Tools & Techniques, and Outputs

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Change Management Process

The process of change management is as follows:

Ability of a project manager to manage change will be tested in the exam.

Integrated Change Control

Projects seldom run according to plan.

- The only constant is change
- Identify that a change needs to occur or has occurred
- Influence the factors that circumvent change control
- Review and approve changes
- Manage approved changes
    - Monitor when and how changes occur
    - Analyze risk impact
    - Socialize and seek change approval (Change Control Board (CCB), Sponsor, Stakeholders)
    - Schedule change
    - Release only approved changes
    - Update project documents (schedule, cost, risk, quality plan, change log)

Business Scenario: Problem Statement

You are the project manager of a new corporate initiative that is focused on revising and re-classifying the staffing positions in its Design Division. The project plan has been developed. Initially, there were some challenges as the teams adjusted to the new staffing positions. However, you have worked with the teams to provide insight on their roles and responsibilities and everything is now progressing smoothly. The past five project team review meetings have shown that you are on schedule and 5% under budget.

Now, you are preparing a project status report for your upcoming meeting with the Project Sponsor. You are positive and excited at your project status despite the rocky start. Unfortunately, the meeting with the Project Sponsor does not go as planned. You are informed by the Sponsor that the deadline for the project needs to be moved up by 30 days and the budget will remain the same. The Sponsor has asked you to submit a plan of action on how you would accomplish this new deadline. What should you do?

Business Scenario: Solution

You need to schedule a team meeting to discuss your strategy and plan for implementing the change. After reviewing your change management plan, your team should first look at the remaining work to be completed to assess what it would take to complete the activities. This relates to the triple constraint of scope, budget, and schedule and other measurable constraints such as quality metrics, risk re-assessment, and resources. Then, the team will be able to brainstorm and analyze how to adjust the calendar accordingly, see if there are opportunities to reduce scope, work overtime, and still meet the budgetary constraint.

After approaching the problem using the triple constraint and change management process, you will be able to create a new viable plan of action so that you will both meet the new deadline and not compromise on the integrity of the deliverable. Using the triple constraint and change control process is a great framework for assessing change and making decisions around change.

Close Project or Phase

Close Project or Phase is the process of finalizing all activities for the project, phase, or contract.

It belongs to the Closing Process Group.

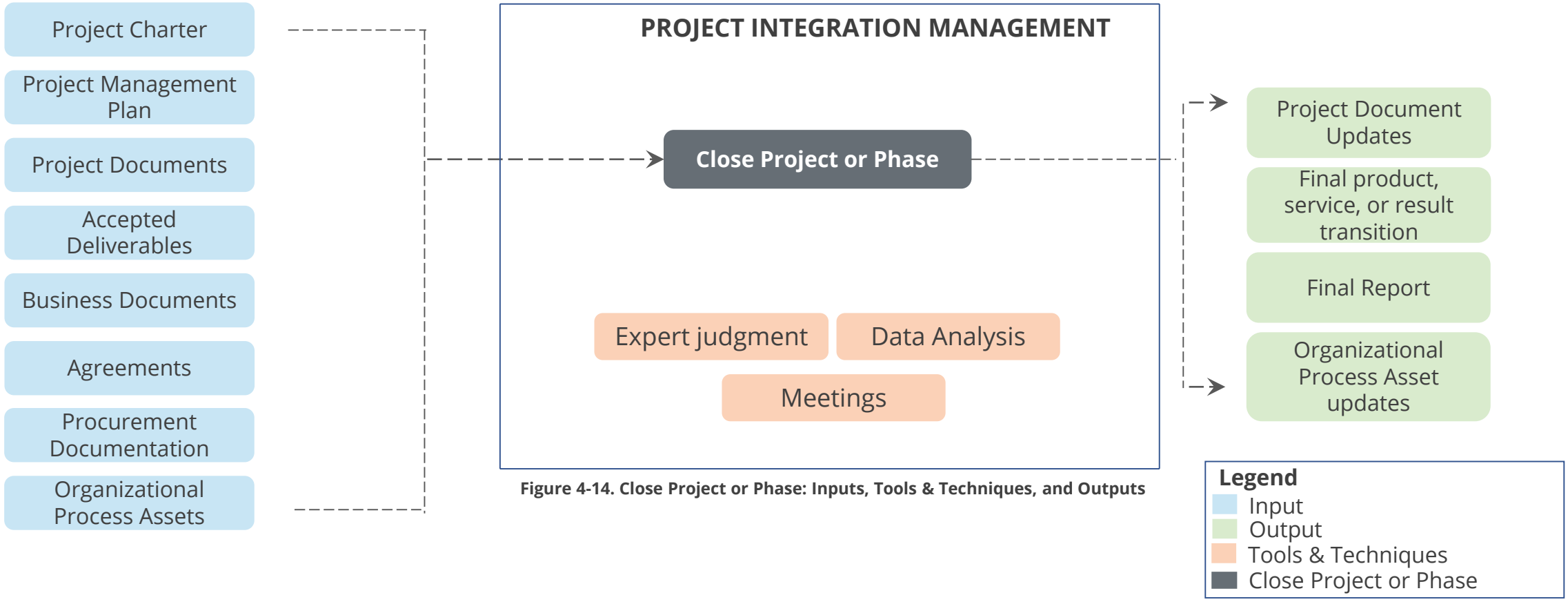

Figure 4-14. Close Project or Phase: Inputs, Tools & Techniques, and Outputs

Project Management Institute, *A Guide to the Project Management Body of Knowledge, (PMBOK® Guide)* – Sixth Edition, Project Management Institute, Inc., 2017, Page 121

Business Scenario: Problem Statement

The ABC Fencing Line of Business (LOB) has been progressing for the past two years and it is now ending. The new LOB is finally ready for its 'Go live' date and will become a new service option for the company. In the last week of work on the project schedule, only 10 of the 50 project team members involved in the life of the project are needed to complete the remaining tasks that will take it live.

You have already been assigned your next project, which starts in 4 weeks, and you are starting to transition into your new responsibilities. What should you be concerned about as you try to Close your project?

Business Scenario: Solution

With both yourself and many of the team members leaving the project, you need to ensure that everyone contributes to the Lessons Learned process before they leave.

Some team members could be apprehensive about contributing because they do not see the value or benefit in this process and feel you could have done it on your own. In that case, you need to explain that lessons learned and historical information are valuable because they give insight and a potential starting point for new projects.

You should inform the team that this is also part of the updates to Organization Process Assets, which is necessary to close the project formally.