Project Management
PROJECT INTEGRATION MANAGEMENT

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PROJECT INTEGRATION MANAGEMENT

- Project Integration Management includes the processes and activities to identify, define, combine, unify, and coordinate the various processes and project management activities within the Project Management Process Groups.

- In the project management context, integration includes characteristics of unification, consolidation, communication, and integrative actions that are crucial to controlled project execution through completion, successfully managing stakeholder expectations, and meeting requirements.

- Project Integration Management includes making choices about resource allocation, making trade-offs among competing objectives and alternatives, and managing the interdependencies among the project management Knowledge Areas.

- The project management processes are usually presented as discrete processes with defined interfaces while, in practice, they overlap and interact in ways that cannot be completely detailed in the course.

- **4.1 Develop Project Charter**—The 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 project activities.

- **4.2 Develop Project Management Plan**—The process of defining, preparing, and coordinating all subsidiary plans and integrating them into a comprehensive project management plan. The project's integrated baselines and subsidiary plans may be included within the project management plan.

- **4.3 Direct and Manage Project Work**—The process of leading and performing the work defined in the project management plan and implementing approved changes to achieve the project's objectives.

- **4.4 Monitor and Control Project Work**—The process of tracking, reviewing, and reporting Project progress against the performance objectives defined in the project management plan.

- **4.5 Perform Integrated Change Control**—The process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating their disposition.

- **4.6 Close Project or Phase**—The process of finalizing all activities across all of the Project Management Process Groups to formally complete the phase or project.
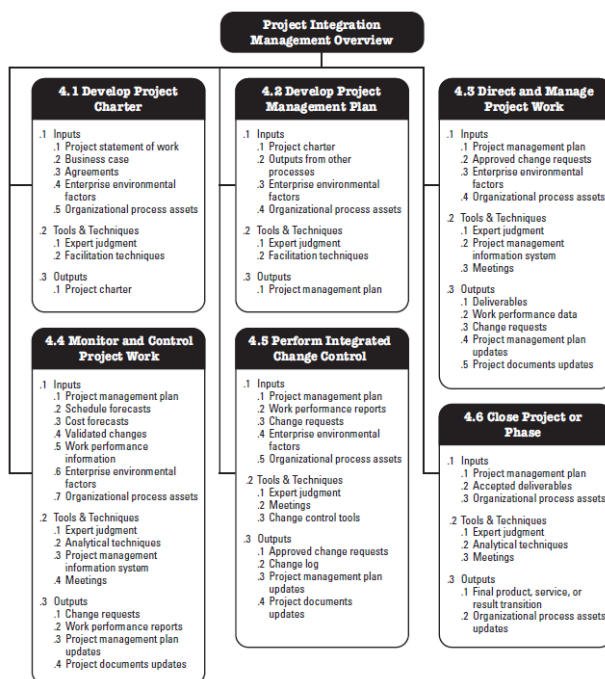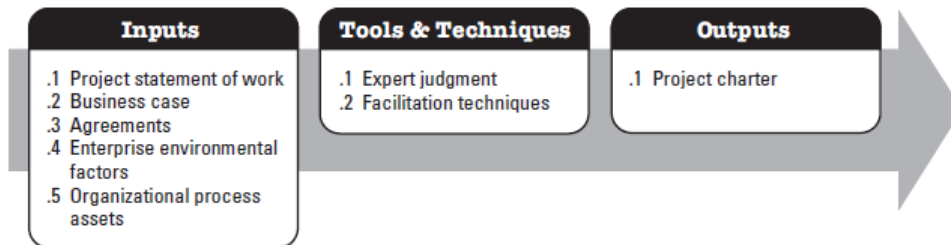

Figure 4-1. Project Integration Management Overview

- The need for Project Integration Management is necessary in situations where individual processes interact.

- The project deliverables may also need integrating with ongoing operations of the performing organization, the requesting organization, and with the long-term strategic planning that takes future problems and opportunities into consideration.

- Project Integration Management also includes the activities needed to manage project documents to ensure consistency with the project management plan and product, service, or capability deliverables.

- Most experienced project management practitioners know there is no single way to manage a project.

- However, the determination that a particular process is not required does not mean that it should not be addressed. The project manager and project team need to address every process and the project environment to determine the level of implementation for each process within the project.

- The integrative nature of projects and project management can be understood by thinking of other types of activities performed while completing a project. Examples of some activities performed by the project management team are:
  - Develop, review, analyze, and understand the scope. This includes the project and product requirements, criteria, assumptions, constraints, and other influences related to a project, and how each will be managed or addressed within the project;
  - Transform the collected project information into a project management plan using a structured approach;
  - Perform activities to produce project deliverables; and
  - Measure and monitor the project's progress and take appropriate action to meet project objectives.

4.1 Develop Project Charter

- Develop Project Charter is the 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 project activities.
- The key benefit of this process is a well-defined project start and project boundaries, creation of a formal record of the project, and a direct way for senior management to formally accept and commit to the project.

Inputs	Tools & Techniques	Outputs
.1 Project statement of work .2 Business case .3 Agreements .4 Enterprise environmental factors .5 Organizational process assets	.1 Expert judgment .2 Facilitation techniques	.1 Project charter

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

- The project charter establishes a partnership between the performing and requesting organizations.
- In the case of external projects, a formal contract is typically the preferred way to establish an agreement.
- In this case, the project team becomes the seller responding to conditions of an offer to buy from an outside entity.
- The approved project charter formally initiates the project.
- The Project charter provides the project manager with the authority to plan and execute the project.
- It is recommended that the project manager participate in the development of the project charter to obtain a foundational understanding of the project requirements.

4.1.1 Develop Project Charter: Inputs
4.1.1.1 Project Statement of Work

- The project statement of work (SOW) is a narrative description of products, services, or results to be delivered by a project.

- For internal projects, the project initiator or sponsor provides the statement of work based on business needs, product, or service requirements.

- For external projects, the statement of work can be received from the customer as part of a bid document, (e.g., a request for proposal, request for information, or request for bid) or as part of a contract.

4.1.1.2 Business Case

- The business case or similar document describes the necessary information from a business standpoint to determine whether or not the project is worth the required investment.

- It is commonly used for decision making by managers or executives above the project level.

- Typically, the business need and the cost-benefit analysis are contained in the business case to justify and establish boundaries for the project, and such analysis is usually completed by a business analyst using various stakeholder inputs.

- The sponsor should agree to the scope and limitations of the business case.

4.1.1.3 Agreements

- Agreements are used to define initial intentions for a project. Agreements may take the form of contracts, memorandums of understanding (MOUs), service level agreements (SLA), letter of agreements, letters of intent, verbal agreements, email, or other written agreements.
- Typically, a contract is used when a project is being performed for an external customer.

4.1.1.4 Enterprise Environmental Factors

- The enterprise environmental factors that can influence the Develop Project Charter process include, but are not limited to:
  - Governmental standards, industry standards, or regulations (e.g. codes of conduct, quality standards, or worker protection standards),
  - Organizational culture and structure, and
  - Marketplace conditions.

4.1.1.5 Organizational Process Assets

- The organizational process assets that can influence the Develop Project Charter process include, but are not limited to:
  - Organizational standard processes, policies, and process definitions,
  - Templates (e.g., project charter template), and
  - Historical information and lessons learned knowledge base (e.g., projects, records, and documents; all project closure information and documentation; information about both the results of previous Project selection decisions and previous project performance information; and information from the risk management activity).

4.1.2 Develop Project Charter: Tools and Techniques
4.1.2.1 Expert Judgment

- Expert judgment is often used to assess the inputs used to develop the project charter. Expert judgment is applied to all technical and management details during this process. Such expertise is provided by any group or individual with specialized knowledge or training and is available from many sources, including:
  - Other units within the organization,
  - Consultants,
  - Stakeholders, including customers or sponsors,
  - Professional and technical associations,
  - Industry groups,
  - Subject matter experts (SME), and
  - Project management office (PMO).

4.1.2.2 Facilitation Techniques

- Facilitation techniques have broad application within project management processes and guide the development of the project charter.
- Brainstorming, conflict resolution, problem solving, and meeting management are examples of key techniques used by facilitators to help teams and individuals accomplish project activities.
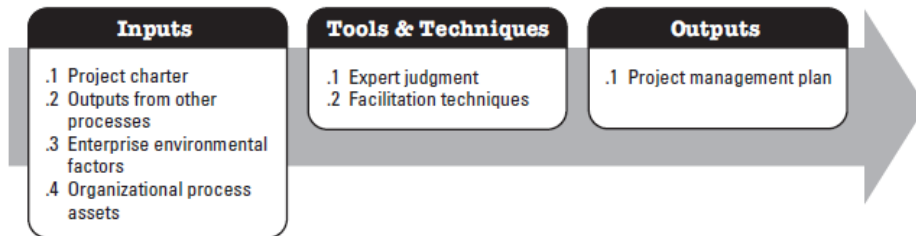
4.1.3 Develop Project Charter: Outputs
4.1.3.1 Project Charter

- The project charter is the document issued by the project initiator or sponsor that formally authorizes the existence of a project and provides the project manager with the authority to apply organizational resources to project activities.

- It documents the business needs, assumptions, constraints, the understanding of the customer's needs and high-level requirements, and the new product, service, or result that it is intended to satisfy, such as:
  - Project purpose or justification,
  - Measurable project objectives and related success criteria,
  - High-level requirements,
  - Assumptions and constraints,
  - High-level project description and boundaries,
  - High-level risks,
  - Summary milestone schedule,
  - Summary budget,
  - Stakeholder list,
  - Project approval requirements (i.e., what constitutes project success, who decides the project is successful, and who signs off on the project),
  - Assigned project manager, responsibility, and authority level, and
  - Name and authority of the sponsor or other person(s) authorizing the project charter

4.2 Develop Project Management Plan

- Develop Project Management Plan is the process of defining, preparing, and coordinating all subsidiary plans and integrating them into a comprehensive project management plan.
- The key benefit of this process is a central document that defines the basis of all project work.

Inputs	Tools & Techniques	Outputs
.1 Project charter .2 Outputs from other processes .3 Enterprise environmental factors .4 Organizational process assets	.1 Expert judgment .2 Facilitation techniques	.1 Project management plan

Figure 4-3. Develop Project Charter Data Flow Diagram

- The project management plan defines how the project is executed, monitored and controlled, and closed.

- The project management plan's content varies depending upon the application area and complexity of the project.

- It is developed through a series of integrated processes extending through project closure.

4.2.1 Develop Project Management Plan: Inputs
4.2.1.1 Project Charter

- The size of the project charter varies depending on the complexity of the project and the information known at the time of its creation.
- At a minimum, the project charter should define the high-level boundaries of the project.
- The project manager uses the project charter as the starting point for initial planning throughout the Initiating Process Group.

4.2.1.2 Outputs from Other Processes

- Outputs from many of the other processes described in following Sections are integrated to create/evolve the project management plan.
- Any baselines and subsidiary plans that are an output from other planning processes are inputs to this process.
- In addition, changes to these documents may necessitate updates to the Project management plan.

4.2.1.3 Enterprise Environmental Factors

- The enterprise environmental factors that can influence the Develop Project Management Plan process include, but are not limited to:
    - Governmental or industry standards;
    - Project management body of knowledge for vertical market (e.g., construction) and/or focus area (e.g. environmental, safety, risk, or agile software development);
    - Project management information system (e.g., an automated tool, such as a scheduling software tool, a configuration management system, an information collection and distribution system, or web interfaces to other online automated systems);

4.2.1.4 Organizational Process Assets

- The organizational process assets that can influence the Develop Project Management Plan process include, but are not limited to:
    - Standardized guidelines, work instructions, proposal evaluation criteria, and performance measurement criteria;
    - Project management plan template, • Change control procedures, including the steps by which official organization standards, policies, plans, and procedures, or any project documents will be modified and how any changes will be approved and validated;
    - Project files from previous projects (e.g., scope, cost, schedule and performance measurement baselines, project calendars, project schedule network diagrams, and risk registers,);
    - Historical information and lessons learned knowledge base; and
    - Configuration management knowledge base containing the versions and baselines of all official organization standards, policies, procedures, and any project documents.

4.2.2 Develop Project Management Plan: Tools and Techniques
4.2.2.1 Expert Judgment

- When developing the project management plan, expert judgment is utilized to:
  - Tailor the process to meet the project needs,
  - Develop technical and management details to be included in the project management plan,
  - Determine resources and skill levels needed to perform project work,
  - Define the level of configuration management to apply on the project,
  - Determine which project documents will be subject to the formal change control process, and
  - Prioritize the work on the project to ensure the project resources are allocated to the appropriate work at the appropriate time.

4.2.2.2 Facilitation Techniques

- Facilitation techniques have broad application within project management processes and are used to guide the development of the project management plan.
- Brainstorming, conflict resolution, problem solving, and meeting management are key techniques used by facilitators to help teams and individuals achieve agreement to accomplish project activities.

4.2.3 Develop Project Management Plan: Outputs
4.2.3.1 Project Management Plan

• The project management plan is the document that describes how the project will be executed, monitored, and controlled. It integrates and consolidates all of the subsidiary plans and baselines from the planning processes.

• Project baselines include, but are not limited to:
  • Scope baseline,
  • Schedule baseline, and
  • Cost baseline.

Table 4-1 Differentiation Between the Project Management Plan and Project Documents

Project Management Plan	Project Documents	
Change management plan	Activity attributes	Project staff assignments
Communications management plan	Activity cost estimates	Project statement of work
Configuration management plan	Activity duration estimates	Quality checklists
Cost baseline	Activity list	Quality control measurements
Cost management plan	Activity resource requirements	Quality metrics
Human resource management plan	Agreements	Requirements documentation
Process improvement plan	Basis of estimates	Requirements traceability matrix
Procurement management plan	Change log	Resource breakdown structure
Scope baseline • Project scope statement • WBS • WBS dictionary	Change requests	Resource calendars
Quality management plan	Forecasts • Cost forecast • Schedule forecast	Risk register

Quality management plan	Forecasts • Cost forecast • Schedule forecast	Risk register
Requirements management plan	Issue log	Schedule data
Risk management plan	Milestone list	Seller proposals
Schedule baseline	Procurement documents	Source selection criteria
Schedule management plan	Procurement statement of work	Stakeholder register
Scope management plan	Project calendars	Team performance assessments
Stakeholder management plan	Project charter Project funding requirements Project schedule Project schedule network diagrams	Work performance data Work performance information Work performance reports

4.3 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 and implementing approved changes to achieve the project's objectives.
- The key benefit of this process is that it provides overall management of the project work.

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

- Direct and Manage Project Work activities include, but are not limited to:
  - Perform activities to accomplish project objectives;
  - Create project deliverables to meet the planned project work;
  - Provide, train, and manage the team members assigned to the project;
  - Obtain, manage, and use resources including materials, tools, equipment, and facilities;
  - Implement the planned methods and standards;
  - Establish and manage project communication channels, both external and internal to the project team;
  - Generate work performance data, such as cost, schedule, technical and quality progress, and status to facilitate forecasting;
  - Issue change requests and implement approved changes into the project's scope, plans, and environment;
  - Manage risks and implement risk response activities;
  - Manage sellers and suppliers;
  - Manage stakeholders and their engagement; and
  - Collect and document lessons learned and implement approved process improvement activities.

- Direct and Manage Project Work also requires review of the impact of all project changes and the implementation of approved changes:
  - **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; and/or
  - **Defect repair**—An intentional activity to modify a nonconforming product or product component.

4.3.1 Direct and Manage Project Work: Inputs
4.3.1.1 Project Management Plan

- The project management plan contains subsidiary plans concerning all aspects of the project.
- Those subsidiary plans related to project work include, but are not limited to:
  - Scope management plan,
  - Requirements management plan,
  - Schedule management plan,
  - Cost management plan, and
  - Stakeholder management plan

4.3.1.2 Approved Change Requests

- Approved change requests are an output of the Perform Integrated Change Control process, and include those requests reviewed and approved for implementation by the change control board (CCB).
- The approved change request may be a corrective action, a preventative action, or a defect repair.
- Approved change requests are scheduled and implemented by the project team, and can impact any area of the project or project management plan.
- The approved change requests can also modify the policies, project management plan, procedures, costs, or budgets or revise the schedules.
- Approved change requests may require implementation of preventive or corrective actions.

4.3.1.3 Enterprise Environmental Factors

- The Direct and Manage Project Work process is influenced by enterprise environmental factors that include, but are not limited to:
    - Organizational, company, or customer culture and structure of the performing or sponsor organizations;
    - Infrastructure (e.g., existing facilities and capital equipment);
    - Personnel administration (e.g., hiring and firing guidelines, employee performance reviews, and training records);
    - Stakeholder risk tolerances, for example allowable cost overrun percentage; and
    - Project management information system (e.g., an automated tool suite, such as a scheduling software tool, a configuration management system, an information collection and distribution system, or web interfaces to other online automated systems).

4.3.1.4 Organizational Process Assets

- The organizational process assets that can influence the Direct and Manage Project Work process include, but are not limited to:
  - Standardized guidelines and work instructions;
  - Communication requirements defining allowed communication media, record retention, and security requirements;
  - Issue and defect management procedures defining issue and defect controls, issue and defect identification and resolution, and action item tracking;
  - Process measurement database used to collect and make available measurement data on processes and products;
  - Project files from previous projects (e.g., scope, cost, schedule, performance measurement baselines, project calendars, project schedule, network diagrams, risk registers, planned response actions, defined risk impact, and documented lessons learned); and
  - Issue and defect management database(s) containing historical issue and defect status, control information, issue and defect resolution, and action item results.

4.3.2 Direct and Manage Project Work: Tools and Techniques
4.3.2.1 Expert Judgment

- Expert judgment is used to assess the inputs needed to direct and manage execution of the project management plan.

- Such judgment and expertise are applied to all technical and management details during this process.

- This expertise is provided by the project manager and the project management team using specialized knowledge or training.

4.3.2.2 Project Management Information System

- The project management information system, which is part of the environmental factors, provides access to tools, such as a scheduling tool, a work authorization system, a configuration management system, an information collection and distribution system, or interfaces to other online automated systems.
- Automated gathering and reporting on key performance indicators (KPI) can be part of this system.

4.3.2.3 Meetings

- Meetings are used to discuss and address pertinent topics of the project when directing and managing Project work.
- Each attendee should have a defined role to ensure appropriate participation.
- Meetings tend to be one of three types:
  - Information exchange;
  - Brainstorming, option evaluation, or design; or
  - Decision making.

- Meetings should be prepared with a well-defined agenda, purpose, objective, and time frame and should be appropriately documented with meeting minutes and action items.

- Meeting minutes should be stored as defined in the project management plan.

4.3.3 Direct and Manage Project Work: Outputs
4.3.3.1 Deliverables

- A deliverable is any unique and verifiable product, result or capability to perform a service that is required to be produced to complete a process, phase, or project.

- Deliverables are typically tangible components completed to meet the project objectives and can include elements of the project management plan.

4.3.3.2 Work Performance Data

- Work performance data are the raw observations and measurements identified during activities being performed to carry out the project work.
- Data are often viewed as the lowest level of detail from which information is derived by other processes.
- Data is gathered through work execution and passed to the controlling processes of each process area for further analysis.

4.3.3.3 Change Requests

- A change request is a formal proposal to modify any document, deliverable, or baseline.
- An approved change request will replace the associated document, deliverable, or baseline and may result in an update to other parts of the project management plan.
- When issues are found while project work is being performed, change requests are submitted, which may modify project policies or procedures, project scope, project cost or budget, Project schedule, or project quality.
- Other change requests cover the needed preventive or corrective actions to forestall negative impact later in the project.

4.3.3.4 Project Management Plan Updates

- Elements of the project management plan that may be updated include, but are not limited to:
    - Scope management plan,
    - Requirements management plan,
    - Schedule management plan,
    - Cost management plan,
    - Quality management plan,
    - Process improvement plan,
    - Human resource management plan,
    - Communications management plan,
    - Risk management plan,
    - Procurement management plan,
    - Stakeholder management plan, and
    - Project baselines.

4.4 Monitor and Control Project Work

- Monitor and Control Project Work is the process of tracking, reviewing, and reporting the progress to meet the performance objectives defined in the project management plan.

- The key benefit of this process is that it allows stakeholders to understand the current state of the project, the steps taken, and budget, schedule, and scope forecasts.
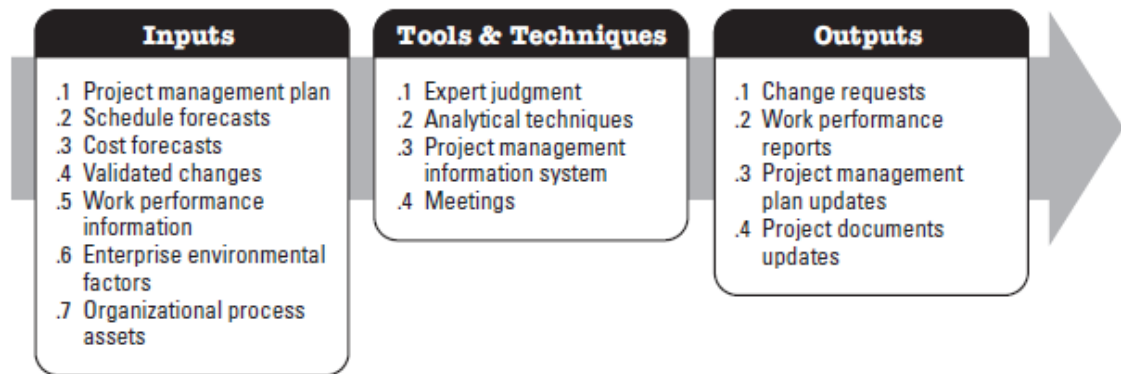
Figure 4-8. Monitor and Control Project Work: Inputs, Tools & Techniques, and Outputs

- Monitoring is an aspect of project management performed throughout the project.
- Monitoring includes collecting, measuring, and distributing performance information, and assessing measurements and trends to effect process improvements.

4.4.1 Monitor and Control Project Work: Inputs

- 4.4.1.1 Project Management Plan
- 4.4.1.2 Schedule Forecasts
- 4.4.1.3 Cost Forecasts
- 4.4.1.4 Validated Changes
- 4.4.1.5 Work Performance Information
- 4.4.1.6 Enterprise Environmental Factors
- 4.4.1.7 Organizational Process Assets

# 4.4.2 Monitor and Control Project Work: Tools and Techniques

- 4.4.2.1 Expert Judgment
- 4.4.2.2 Analytical Techniques
- 4.4.2.3 Project Management Information System
- 4.4.2.4 Meetings

4.4.3 Monitor and Control Project Work: Outputs

- 4.4.3.1 Change Requests
- 4.4.3.2 Work Performance Reports
- 4.4.3.3 Project Management Plan Updates
- 4.4.3.4 Project Documents Updates

4.5 Perform Integrated Change Control

- Perform Integrated Change Control is the process of reviewing all change requests; approving changes and managing changes to deliverables, organizational process assets, project documents, and the project management plan; and communicating their disposition.
- It reviews all requests for changes or modifications to project documents, deliverables, baselines, or the project management plan and approves or rejects the changes.
- The key benefit of this process is that it allows for documented changes within the project to be considered in an integrated fashion while reducing project risk, which often arises from changes made without consideration to the overall Project objectives or plans.
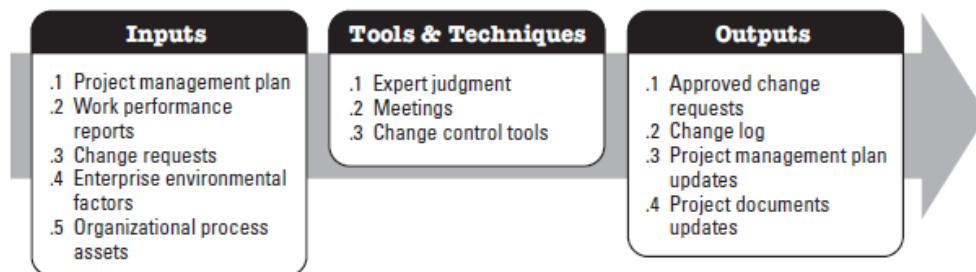
Figure 4-10. Perform Integrated Change Control: Inputs, Tools & Techniques, and Outputs

- Configuration control is focused on the specification of both the deliverables and the processes; while change control is focused on identifying, documenting, and approving or rejecting changes to the project documents, deliverables, or baselines.

- Some of the configuration management activities included in the Perform Integrated Change Control process are as follows:
  - **Configuration identification**. Identification and selection of a configuration item to provide the basis for which the product configuration is defined and verified, products and documents are labeled, changes are managed, and accountability is maintained.

- **Configuration status accounting**. Information is recorded and reported as to when appropriate data about the configuration item should be provided. This information includes a listing of approved configuration identification, status of proposed changes to the configuration, and the implementation status of approved changes.
- **Configuration verification and audit**. Configuration verification and configuration audits ensure the composition of a project's configuration items is correct and that corresponding changes are registered, assessed, approved, tracked, and correctly implemented. This ensures the functional requirements defined in the configuration documentation have been met.

4.5.1 Perform Integrated Change Control: Inputs

- 4.5.1.1 Project Management Plan
- 4.5.1.2 Work Performance Reports
- 4.5.1.3 Change Requests
- 4.5.1.4 Enterprise Environmental Factors
- 4.5.1.5 Organizational Process Assets

4.5.2 Perform Integrated Change Control: Tools and Techniques

- 4.5.2.1 Expert Judgment
- 4.5.2.2 Meetings
- 4.5.2.3 Change Control Tools

4.5.3 Perform Integrated Change Control: Outputs

- 4.5.3.1 Approved Change Requests
- 4.5.3.2 Change Log
- 4.5.3.3 Project Management Plan Updates
- 4.5.3.4 Project Documents Updates

4.6 Close Project or Phase

- Close Project or Phase is the process of finalizing all activities across all of the Project Management Process Groups to formally complete the project or phase.

- The key benefit of this process is that it provides lessons learned, the formal ending of project work, and the release of organization resources to pursue new endeavors.

Inputs	Tools & Techniques	Outputs
.1 Project management plan .2 Accepted deliverables .3 Organizational process assets	.1 Expert judgment .2 Analytical techniques .3 Meetings	.1 Final product, service, or result transition .2 Organizational process assets updates

Figure 4-12. Close Project or Phase: Inputs, Tools & Techniques, and Outputs

- When closing the project, the project manager reviews all prior information from the previous phase closures to ensure that all project work is completed and that the project has met its objectives. Since project scope is measured against the project management plan, the project manager reviews the scope baseline to ensure completion before considering the project closed.

- The Close Project or Phase process also establishes the procedures to investigate and document the reasons for actions taken if a project is terminated before completion.

- In order to successfully achieve this, the project manager needs to engage all the proper stakeholders in the process.

4.6.1 Close Project or Phase: Inputs

- 4.6.1.1 Project Management Plan
- 4.6.1.2 Accepted Deliverables
- 4.6.1.3 Organizational Process Assets

4.6.2 Close Project or Phase: Tools and Techniques

- 4.6.2.1 Expert Judgment
- 4.6.2.2 Analytical Techniques
- 4.6.2.3 Meetings

4.6.3 Close Project or Phase: Outputs

- 4.6.3.1 Final Product, Service, or Result Transition
- 4.6.3.2 Organizational Process Assets Updates

Questions?