Project Integration Management

The Key to Overall Project Success: Good Project Integration Management

- Project managers must coordinate all of the other knowledge areas throughout a project's life cycle
- Many new project managers have trouble looking at the "big picture" and want to focus on too many details
- Project integration management is not the same thing as software integration
- Project integration management includes the processes required to ensure that the various elements of the project are properly coordinated.
- It includes the processes needed to identify, define, combine, unify and coordinate the various processes and project management activities within the Project Management Process Groups.

Project Integration Management processes

- Project Integration Management processes, which are as follows:
- **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.
- **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.
- **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.

Project Integration Management processes

- **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.
- **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.
- **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.

Project Integration Management Process

- Integration Management Process Includes:
  - Develop Project charters
  - Develop Preliminary Project Scope Statement
  - Develop Project Management Plan
  - Direct and Manage Project Execution
  - Monitor and Control Project Work
  - Integrated Change Control
  - Close Project

Develop Project charters

- Developing Project Charter-Part of ***Project Initiation Phase***
- Project Charter authorize PM to start the project and to use organizational resources as required
- Document that formally recognizes the existence of a project and provides direction on project objectives and management

Develop Project charters

It should address following

- Requirements that satisfy customer, sponsor and other stakeholder needs, wants and expectations
- Business needs, high level project description or product requirements that the project is undertaken to address
- Project purpose or justification
- Assigned Project Manager and authority level
- Summary Milestone schedule

Develop Project charters

It should address following:

- Stakeholder Influences
- Functional organization and their mode of participation
- Organizational, environment and external assumptions/contraints
- Business case justifying the project , including Return on Investment
- Summary Budget

Project Charters

Develop Project Charter Overview		
INPUTS	TOOLS& TECHNIQUES	OUTPUT
1. Contract Agreement 2. Statement of Work 3. Enterprise Environmental Factors 4. Organizational Process Assets	1. Project Selection Methods 2. Project Management Methodology 3. Project Management Information System (PMIS)	1. Project Charter

Develop Project charters

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

Project Charter: Inputs

- **Project Statement of Work: Business need, Product scope description, Strategic plan**
- **Business Case:** Market demand, Organizational need, Customer request, Technological advance, Legal requirement, Ecological impacts, Social need
- **Agreements**
- **Enterprise Environmental Factors:** Governmental standards, industry standards, or regulations (e.g. codes of conduct, quality standards, or worker protection standards), organizational culture and structure, marketplace conditions, etc.
- **Organizational Process Assets:** Organizational standard processes, policies, and process definitions, templates, and historical information and lessons learned knowledge base

Develop Project Charter: Tools and Techniques

- **Expert Judgment:** Expert judgment is applied to all technical and management details during this process**;** could be **c**onsultants, stakeholders, professional and technical associations, industry groups, Subject matter experts (SME), and Project management office (PMO).
- **Facilitation Techniques:** Brainstorming, conflict resolution, problem solving, and meeting management are examples of key techniques used by facilitators to help teams and individuals accomplish project activities.

Develop Project Charter: Outputs-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. E.g. 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 Assigned project manager, responsibility, and authority level, and Name and authority of the sponsor or other person(s) authorizing the project charter.

The Project Charter

- **Project Charter - describes**
  - Project Need and Perceived Opportunity
  - Key Goals and Objectives
  - Basic Project Scope
  - Identified tangible and intangible benefits from the project
  - Specifies project evaluation criteria

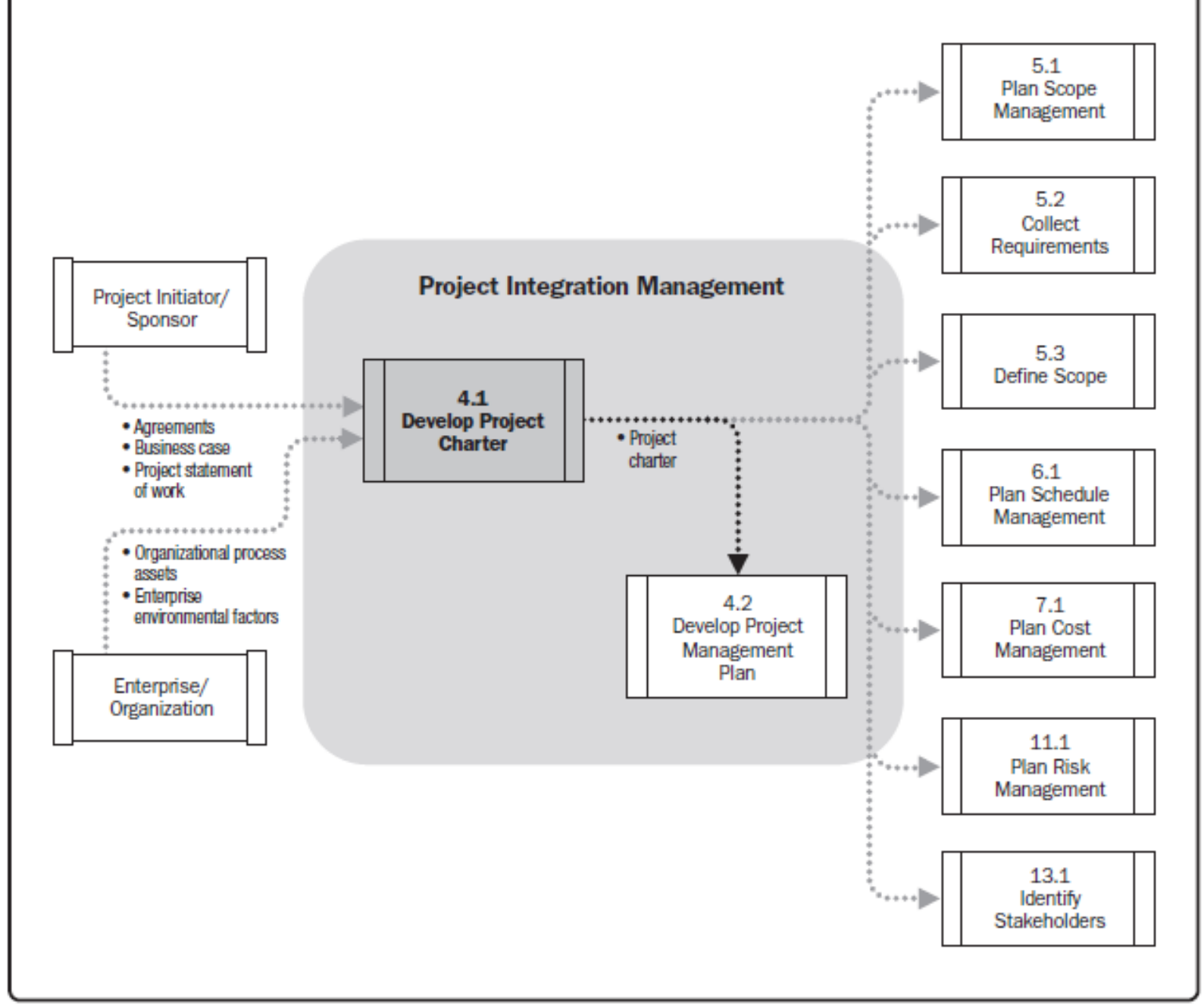


Figure 4-3. Develop Project Charter Data Flow Diagram

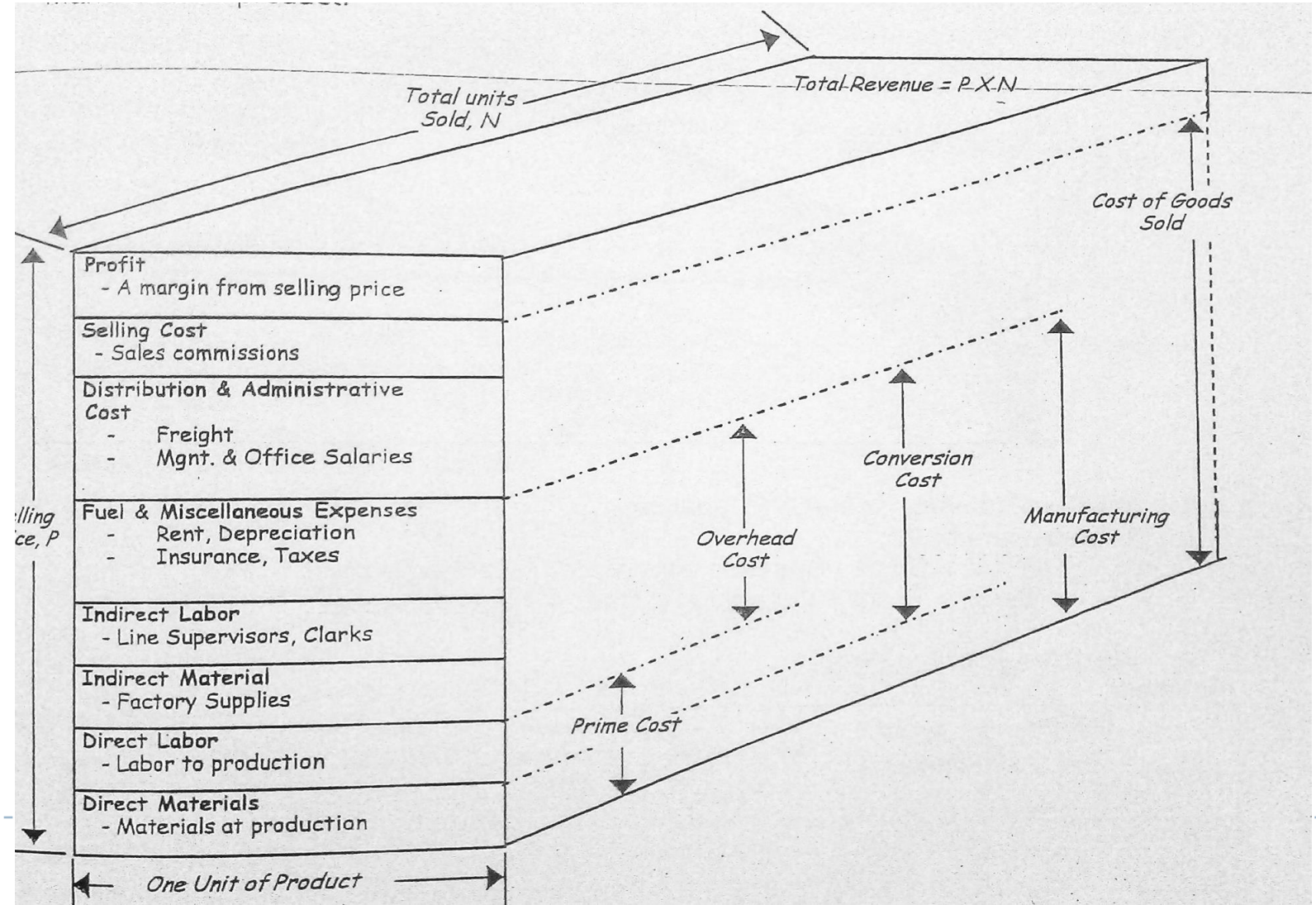
Initiating an IT Project

- Strategic Plan of an Organization (Long term business objectives)
- IT Projects should support strategic and financial business objectives
- Identifying Project Potentials and Initial Planning
  - (Feasibility Study/If available to check system architecture is well elicited)
  - Business Area Analysis
  - Project Potentials and Credibility
  - Select IT Projects and assign Resources
  - Start developing Project Charter by using all findings stated above

Statement of Work

- A Narrative description of products or services to be supplied under contract is called statement of work.
- Statement of Work Includes:
  - Business Need (Due to Market Demand/Customer Request, Technological Advancement, Legal Requirement, Social Needs)
  - Product Description: Known Outline/Characteristics of Product or Services
  - Strategic Plan: Understand Scope, Vision and Goal and Logical Framework

Profit & Cost Relationship



Profit & Cost Relationship

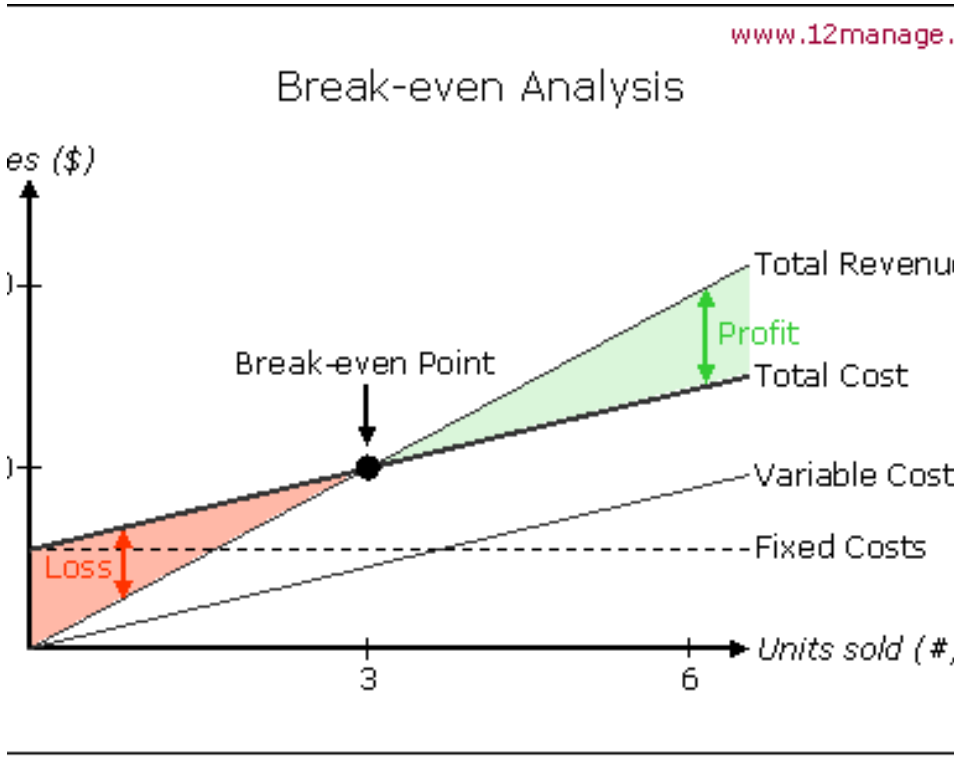
- Different types of Tangible Costs
  - Capital Expenditure
  - Lease Costs
  - Professional Services
  - Sullies and Consumables
  - Support Service Cost (One-off Cost)
  - Overhead cost (Indirect Cost)
- Intangible Costs
  - Cost of Goodwill
  - Intellectual Property
  - Management Team
  - Relationship
  - Contracts

Project Selection Methods

- Constrained Optimization Methods (Mathematical Models)
- Benefit Measurement Methods
  - Cost/Benefit Analysis
  - Weighted Scoring Model
  - Payback Period (PBP)
  - Net Present Value (NPV)
  - Profitability Index (PI)

Project Selection Methods

- At Breakeven Point
  - Profit = Sales – (Variable Expenses + Fixed Expenses)
  - Sales= Profit + Variable expenses + Fixed Expenses



Cost Benefit Analysis

Estimated Benefit = Total Projected Revenue-Total Budgeted Cost

Cost Benefit Ratio (BCR)

- Cost Benefit Ratio (BCR)= Present Value of Benefit (PBV) /Initial Investment (I)
  - Accept if BCR > 1, Reject if BCR < 1, Indifferent if BCR =1
  - Present Benefit = [(***Revenue Earned with Project – Cost of the Project –Operational Cost with the Project***) –(***Revenue Earned with No Project – Operational Cost with No Project***)]

Weighted Scoring Mode

Project	Weight=5	Weight=3	Weight=1	Total Weighted Score
	Profit Potential	Marketability	Easeto Produce/Serve	
Project A	5	4	4	41
Project B	5	3	3	37

Payback Period

- Estimated Length of Time to Cover the Initial Investment into the project
- Management Prefers 'Quick Payback Time'
- Does not Consider Time Value of Money

NET Present Value

- NPV= Present Value of Cash Inflows –Initial Investment
  - Present Value = Future Value/(1 + rate of Interest)^Time Period
  - Selection Rule
    - If NPV > 0 Accept
    - If NPV < 0 Reject
    - If NPV = 0 Indifferent

Profitability Index

- Profitability Index (PI)= NPV/Cost
- Projects with Higher PI will get Preference

Project Management Methodology

- Set of Project Management Process Groups their related control functions that are consolidated and combined into a functioning unified whole
- Example: Standard Project Management Procedure for an ISO or CMMI practicing organization

Project Management Information System

- Special Software to organize resource pools and have:
- Electronic Communication
- Project Information Archive
- Project Data Analysis
- Project Data Analysis and Reporting
- Project Decision Support System
- Project Activity Issue Tracking
- Configuration/Change Management

Expert Judgment

- Expertise from any group individual or organization to gain knowledge or training and is available from many sources like
  - Other Units in the Organization
  - Consultants
  - Stakeholders, including customer sponsors
  - Professional and Technical Associations
  - Industry Groups

Developing Project Management Plan

Project plan development uses the outputs of the other planning processes, including strategic planning, to create a consistent, coherent document that can be used to guide both project execution and project control.

The project plan is used to:

- Guide project execution
- Document project planning decisions regarding alternative chosen
- Facilitate communication among stakeholders
- Define key management reviews as to content, extent, and timing
- Provide a baseline for progress measurement and project control

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.

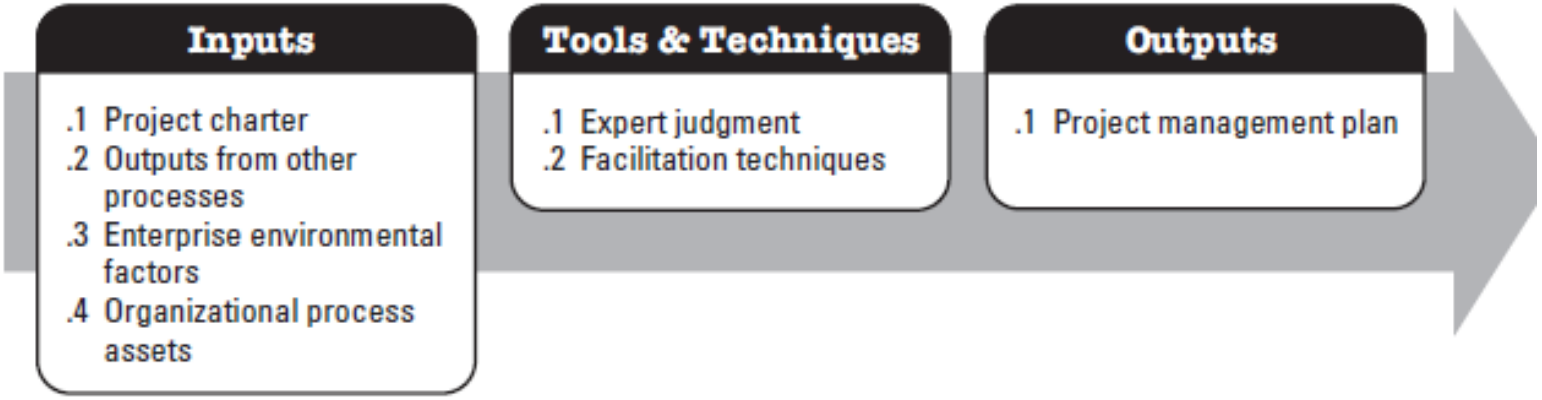


Figure 4-3. Develop Project Charter Data Flow Diagram

Develop Project Management Plan: Inputs

- **Project Charter:** The project manager uses the project charter as the starting point for initial planning throughout the Initiating Process Group.
- **Outputs from Other Processes:** Outputs from many of the other processes are integrated to create the project management plan.
- **Enterprise Environmental Factors and Organizational Process Assets**

Develop Project Management Plan: Tools and Techniques

- **Expert Judgment:** When developing the project management plan, expert judgment is utilized to: Tailor the process, Develop technical and management details, Determine resources and skill needed, Prioritize the work on the , etc.
- **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.

Develop Project Management Plan: Outputs

- **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, such as scope, schedule, and cost management plans and baselines from the planning processes.

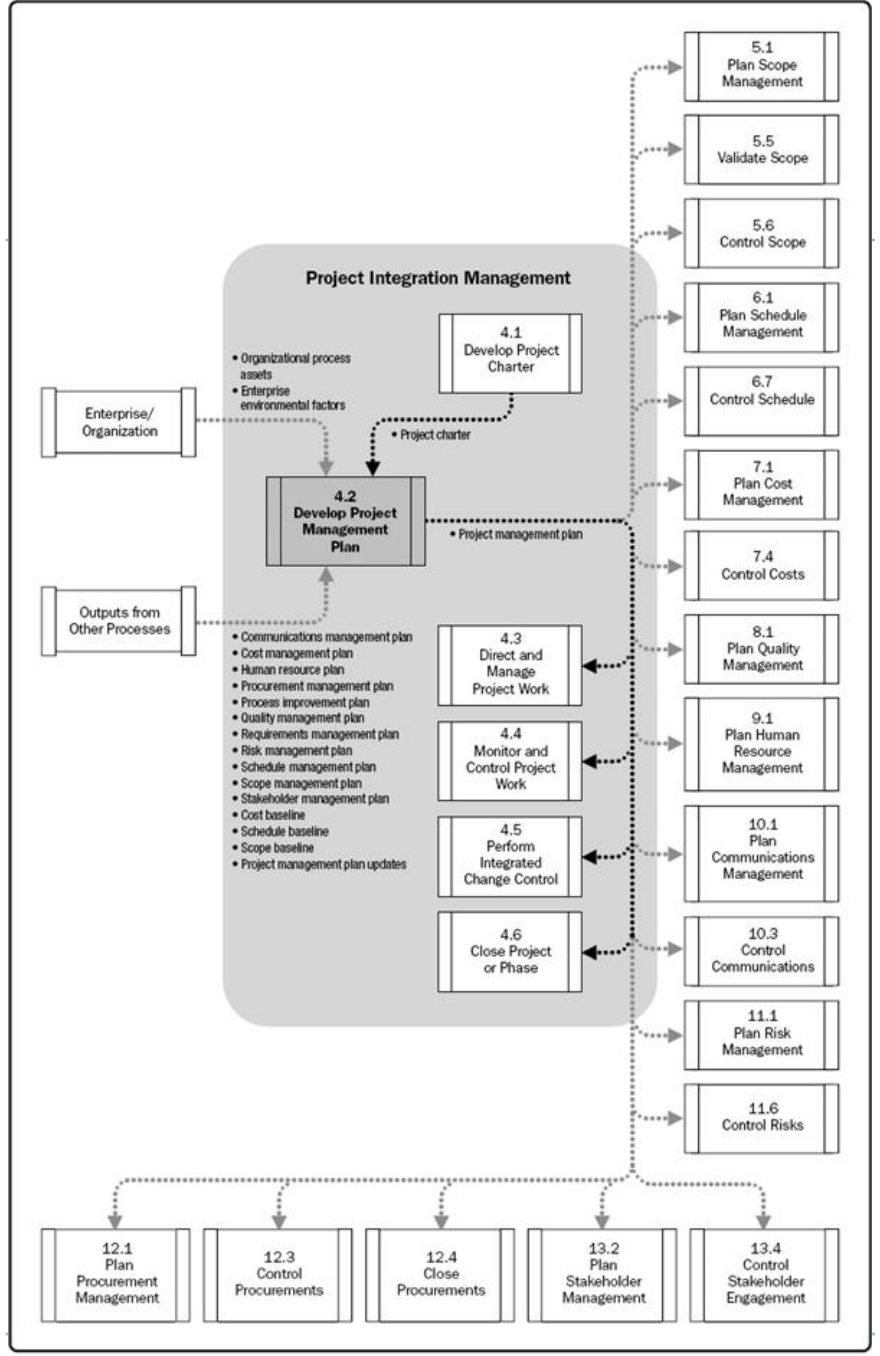


Figure 4-5. Develop Project Management Plan Data Flow Diagram

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.

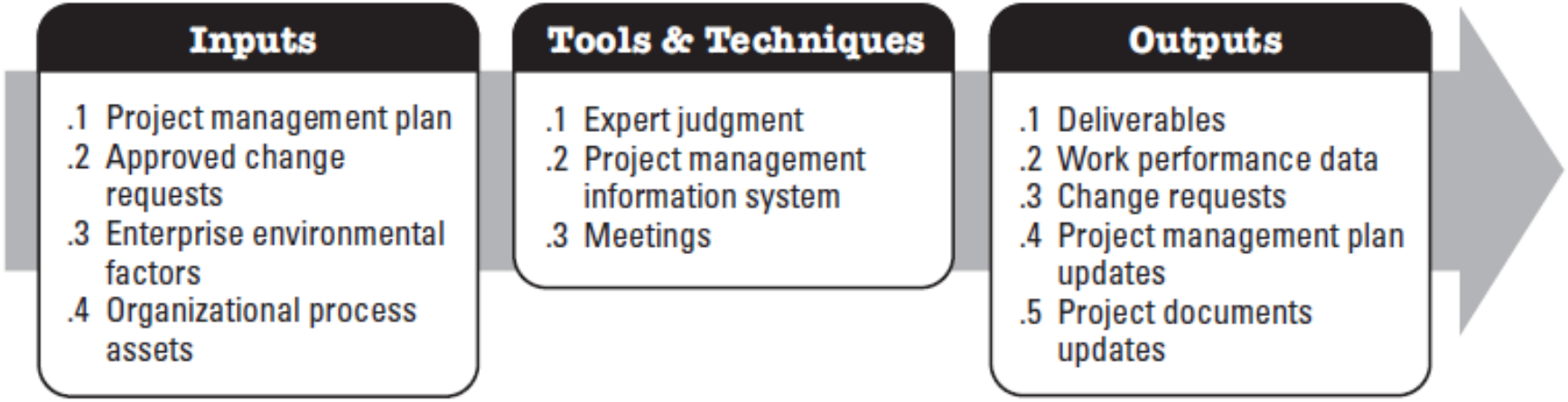


Figure 4-6. Direct and Manage Project Work: Inputs, Tools and Techniques, and Outputs

Direct and Manage Project Work: Inputs

- **Project Management Plan**
- **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.
- **Enterprise Environmental Factors and Organizational Process Assets:** The Direct and Manage Project Work process is influenced by enterprise environmental factors and Organizational Process Assets.

Direct and Manage Project Work: Tools and Techniques

- **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.
- **Project Management Information System:** 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.
- **Meetings:** Meetings are used to discuss and address pertinent topics of the project when directing and managing project work. Meetings tend to be one of three types: Information exchange; Brainstorming, option evaluation, or design; or Decision making.

Direct and Manage Project Work: Outputs

- **Deliverables:** Deliverables are typically tangible components completed to meet the project objectives and can include elements of the project management plan.
- **Work Performance Data:** Work performance data are the **raw observations and measurements identified during activities** being performed to carry out the project work e.g. key performance indicators, technical performance measures, start and finish dates of schedule activities, number of change requests, number of defects, actual costs, and actual durations, etc.
- **Change Requests:** A change request is **a formal proposal to modify any document, deliverable, or baseline**. E.g. Corrective action, Preventive action, Defect repair, updates.
- **Project Management Plan Updates:** Elements of the project management plan, such as scope, requirements, schedule, cost, quality, and risk management that may be updated

Direct and Manage Project Work activities

- 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;

Direct and Manage Project Work activities

- 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.

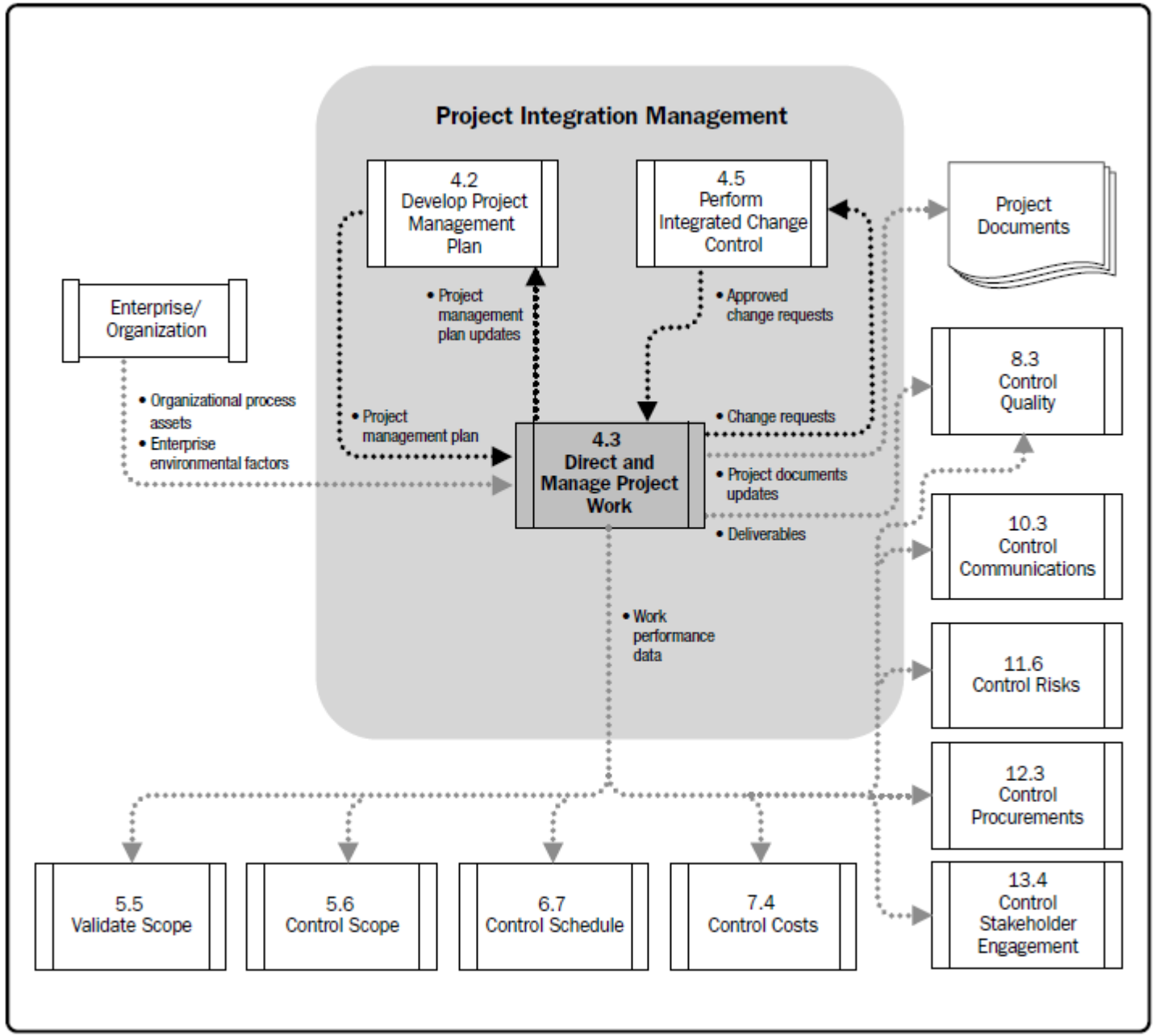


Figure 4-7. Direct and Manage Project Work: Data Flow Diagram

Monitor & Control Project Work

- **Tracking Project Progress - PM Walk Through**

Key Tasks:

- Save a Baseline
- Collect Actual Data
- Update and Refresh Project Plan
- Analyze dependencies and constraints

Monitor & Control Project Work

- **Tracking Project Progress- PM Walk Through**

Key Tasks:

- Analyze Project Plan
  - Study Variance for Actual Start, Actual Finish, Actual Work, remaining Work)
  - Filtered Delayed Tasks
  - Identify Critical Tasks
  - Predict Risks, Costs, Resource, Work Completion
  - Take Decisions on Corrective Actions
  - Share Project Status

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.

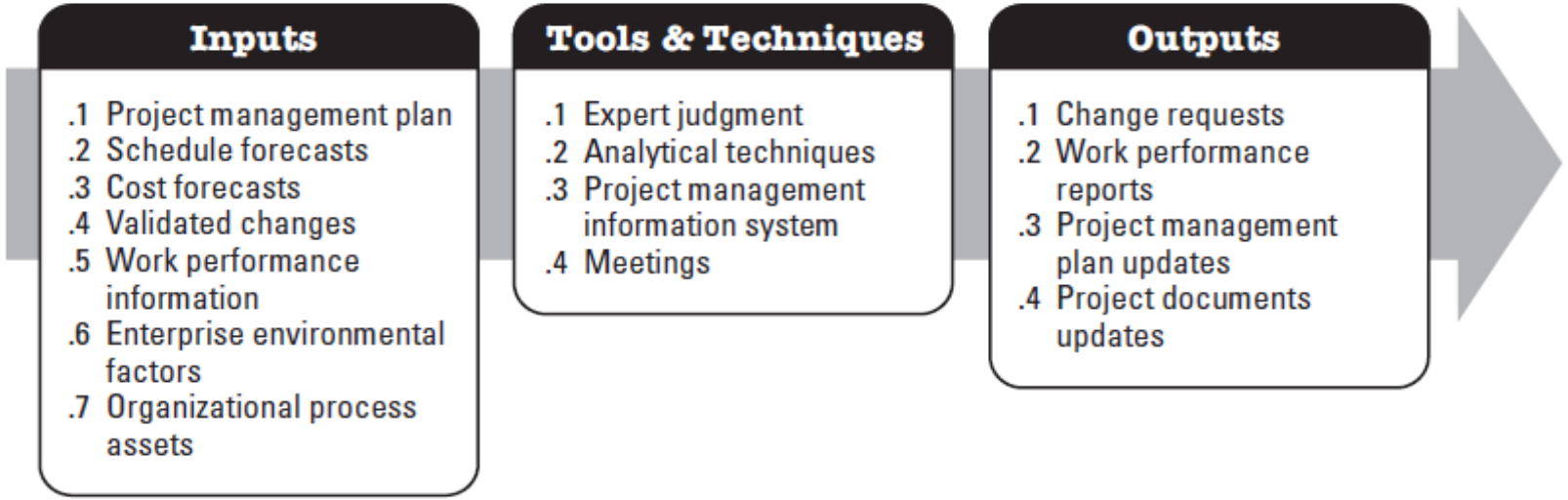


Figure 4-8. Monitor and Control Project Work: Inputs, Tools & Techniques, and Outputs

Monitor and Control Project Work: Inputs

- **Project Management Plan:** Monitoring and controlling project work involves looking at all aspects of the project. Subsidiary plans, such as scope, schedule, cost, quality, HRM, procurement and risk within the project management plan form the basis for controlling the project.
- **Schedule Forecasts:** The schedule forecasts are derived from progress against the schedule baseline and computed time estimate to complete (ETC). This is typically expressed in terms of schedule variance (SV) and schedule performance index (SPI).
- **Cost Forecasts: T**he cost forecasts are derived from progress against the cost baseline and computed estimates to complete (ETC). This is typically expressed in terms of cost variance (CV) and cost performance index (CPI).

Monitor and Control Project Work: Inputs

- **Validated Changes:** Approved changes that result from the Perform Integrated Change Control process require validation to ensure that the change was appropriately implemented.
- **Work Performance Information:** Work performance information is the performance data collected from various controlling processes, analyzed in context, and integrated based on relationships across areas.
- **Enterprise Environmental Factors and Organizational Process Assets:** EEF and he organizational process assets that can influence the Monitor and Control Project Work process

Monitor and Control Project Work: Tools and Techniques

- **Expert Judgment:** Expert judgment is used by the project management team to interpret the information provided by the monitor and control processes. The project manager, in collaboration with the team, determines the actions required to ensure that project performance matches expectations.
- **Analytical Techniques:** Analytical techniques, such as regression analysis, grouping, root case analysis, tend analysis, and variance analysis, are applied in project management **to forecast potential outcomes** based on possible variations of project or environmental variables and their relationships with other variables.

Monitor and Control Project Work: Tools and Techniques

- **Project Management Information System: PMIS** is part of enterprise environmental factors, provides access to automated tools, such as scheduling, cost, and resourcing tools, performance indicators, databases, project records, and financials used during the Monitor and Control Project Work process
- **Meetings:** Meetings may be face-to-face, virtual, formal, or informal. types of meetings include, but are not limited to, user groups and review meetings.

Monitor and Control Project Work: Outputs

- **Change Requests:** As a result of comparing planned results to actual results, change requests may be issued to expand, adjust, or reduce project scope, product scope, or quality requirements and schedule or cost baselines. Changes can impact the project management plan, project documents, or product deliverables. Changes may include corrective action, preventive action, and defect repair.
- **Work Performance Reports:** Work performance reports are the physical or electronic representation of work performance information compiled in project documents, *intended to generate decisions, actions, or awareness*.

Monitor and Control Project Work: Outputs

- **Project Management Plan Updates:** Changes identified during the Monitor and Control Project Work process may affect the overall project management plan elements such as scope, schedule, cost, and quality.
- **Project Documents Updates:** Project documents that may be updated could be Schedule and cost forecasts and Work performance reports.

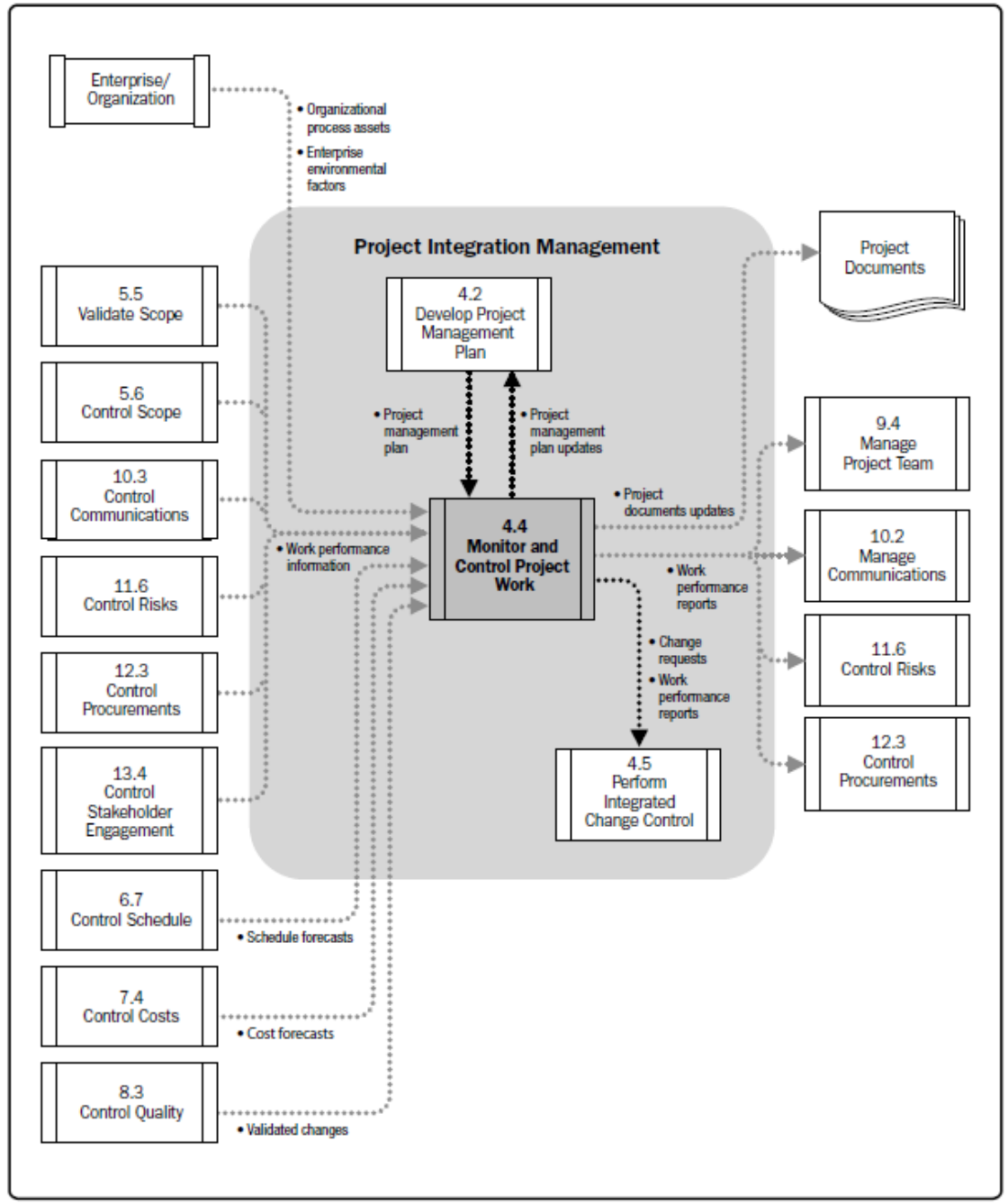


Figure 4-9. Monitor and Control Project Work Data Flow Diagram

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.
- 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.**

Perform Integrated Change Control

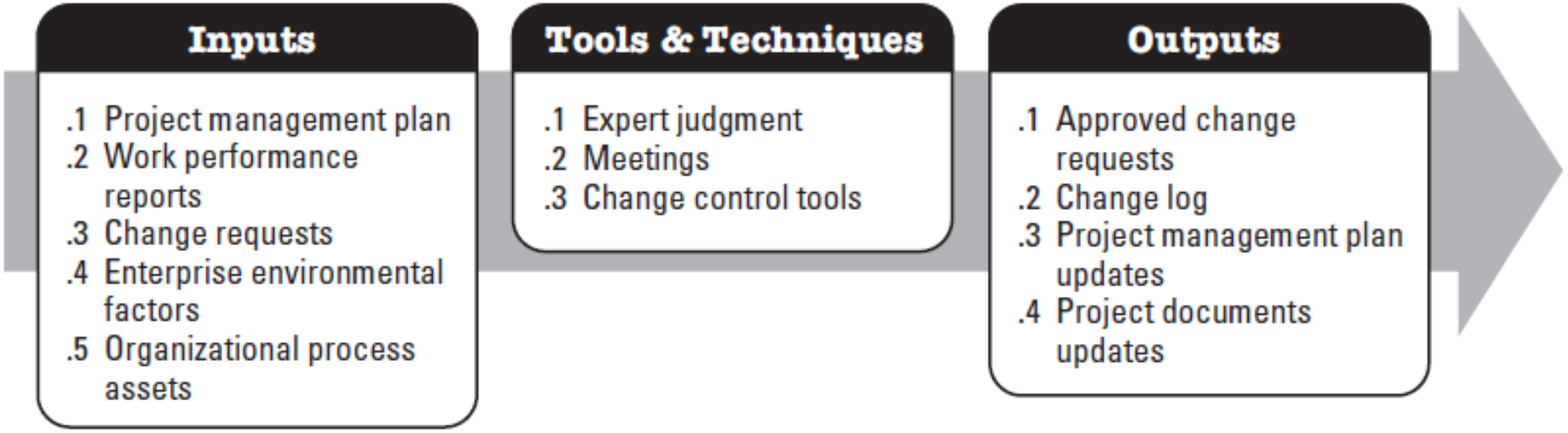


Figure 4-10. Perform Integrated Change Control: Inputs, Tools & Techniques, and Outputs

Perform Integrated Change Control: Inputs

- **Project Management Plan:** Elements of the project management plan that may be used include Scope management plan, which contains the procedures for scope changes; Scope baseline, which provides product definition; and Change management plan, which provides the direction for managing the change control process and documents the formal change control board (CCB).
- **Work Performance Reports:** Work performance reports of particular interest to the Perform Integrated Change Control process include resource availability, schedule and cost data, and earned value management (EVM) reports, burnup or burndown charts.
- **Change Requests**
- **Enterprise Environmental Factors and Organizational Process Assets**

Perform Integrated Change Control: Tools and Techniques

- **Expert Judgment**
- **Meetings**
- **Change Control Tools:** In order to facilitate configuration and change management, manual or automated tools may be used.

Perform Integrated Change Control: Outputs

- **Approved Change Requests**
- **Change Log:** A change log is used to document changes that occur during a project. These changes and their impact to the project in terms of time, cost, and risk, are communicated to the appropriate stakeholders.
- **Project Management Plan Updates**
- **Project Documents Updates**

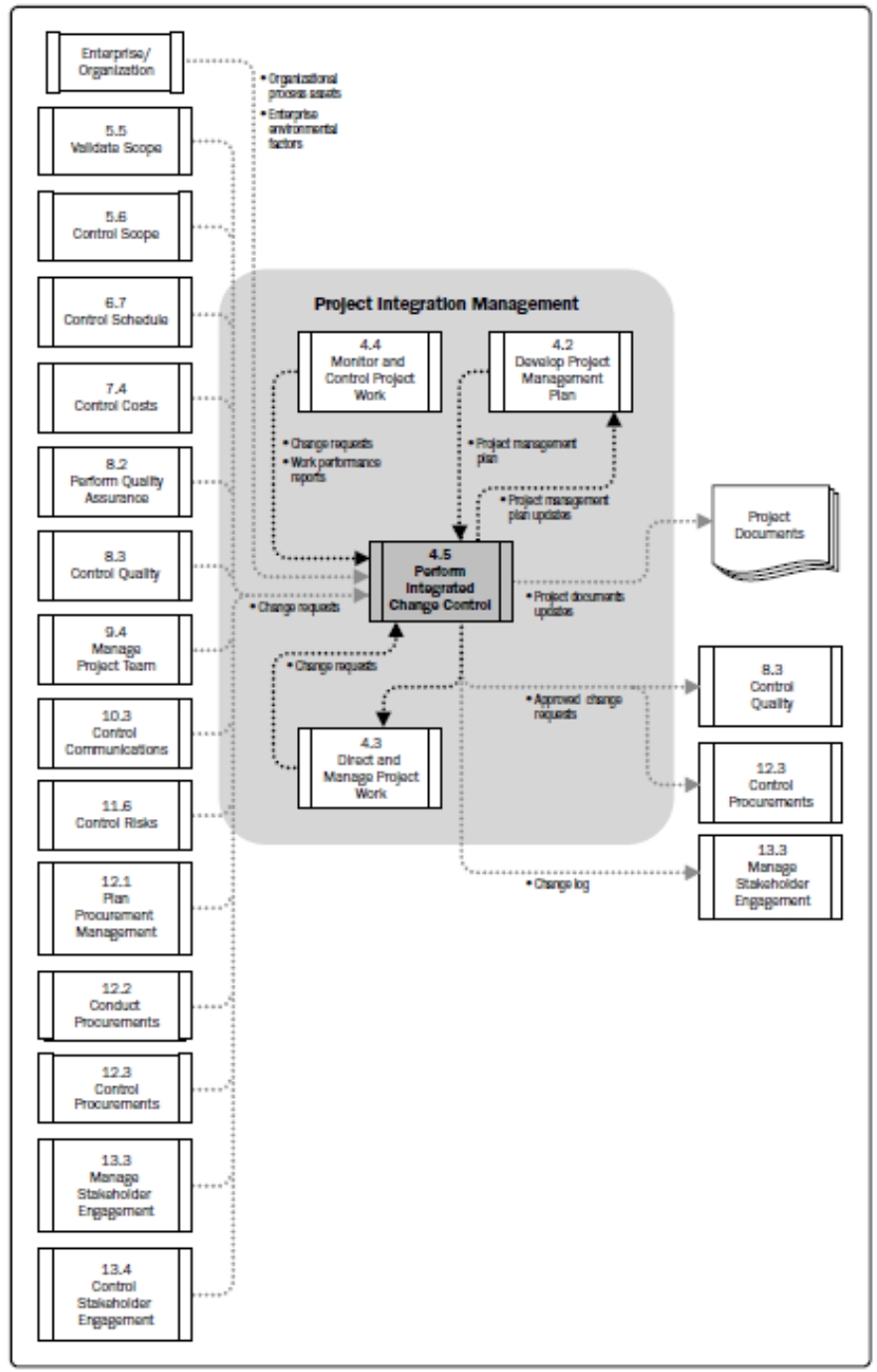


Figure 4-11. Perform Integrated Change Control Data Flow Diagram

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.

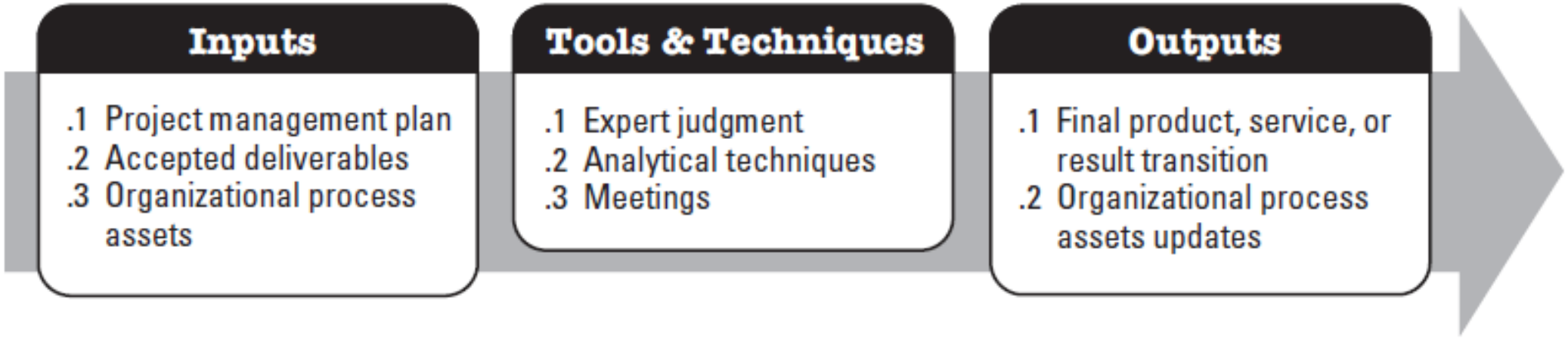
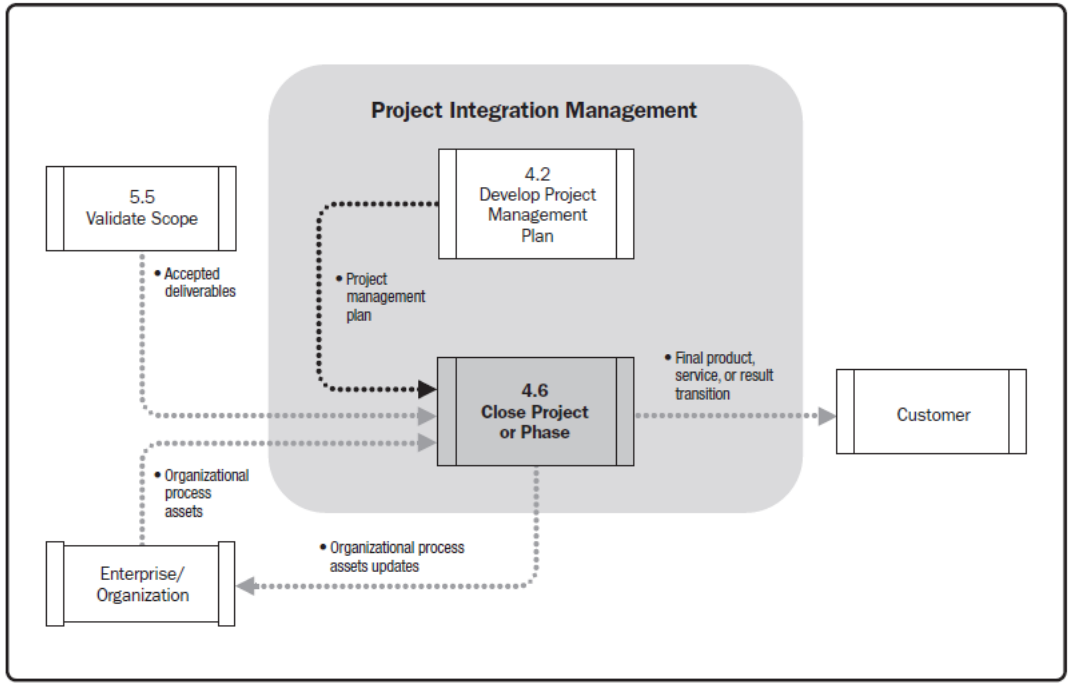


Figure 4-12. Close Project or Phase: Inputs, Tools & Techniques, and Outputs

Close Project or Phase Data Flow Diagram



Close Project or Phase: Inputs

- **Project Management Plan:** The project management plan becomes the agreement between the project manager and project sponsor, defining what constitutes project completion.
- **Accepted Deliverables:** Accepted deliverables may include approved product specifications, delivery receipts, and work performance documents. Partial or interim deliverables may also be included for phased or cancelled projects.

Close Project or Phase: Inputs

- **Organizational Process Assets:** The organizational process assets that can influence the Close Project or Phase process include, but are not limited to Project or phase closure guidelines or requirements (e.g., administrative procedures, project audits, project evaluations, and transition criteria); and Historical information and lessons learned knowledge base (e.g., project 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 risk management activities).

Close Project or Phase: Tools and Techniques

- **Expert Judgment:** Expert judgment is applied when performing administrative closure activities. These experts ensure the project or phase closure is performed to the appropriate standards. Expertise is available from many sources, including: Other project managers within the organization, Project management office (PMO), and Professional and technical associations.
- **Analytical Techniques:** Examples of analytical techniques used in project closeout are: Regression analysis, and Trend analysis.
- **Meetings:** Meetings may be face-to-face, virtual, formal, or informal. This may include project team members and other stakeholders. Types of meetings include lessons learned, closeout, user group, and review meetings.

Close Project or Phase: Outputs

- **Final Product, Service, or Result Transition**
- **Organizational Process Assets Updates:** Project files, Project or phase closure documents and Historical information

Administrative Closure Procedure

- During closing of project
  - Ensure project plan has proper budget/time for closure
  - Populate Project Archives like
    - Indexed Project Reports
    - Financial Records
    - Update Historical Databases
    - Formal Acceptance by Client
    - Recommendation Support from Sponsors/Support Organization
    - Maintenance/Upgrade
    - Trainings
    - Lesson Learnt

Contract Closure Procedure

- Steps
  - Verification of Contract requirement
  - Formal Acceptance by Client
  - Performance Evaluation by buyer of contract
  - Performance evaluation by seller of contract
  - Procurement Audit
  - Update Project Files and historical Databases

Updated Organizational Process Assets

- Formal Acceptance documentation
- Project Files
- Project Closure Documentation
- Archiving is the last step
- Historical Information and lesson learnt