Part 2

The Standard for Project Management

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INTRODUCTION

A standard is a document established by an authority, custom, or general consent as a model or example. This standard was developed using a process based on the concepts of consensus, openness, due process, and balance. This standard describes the processes considered to be good practice on most projects most of the time. These processes are organized by Process Group. It further defines key project management concepts including the relationship of project management to organizational strategy and objectives, governance, portfolio management, program management, the project environment, and project success. It also covers information on project life cycles, project stakeholders, and the role of the project manager. Section 1 discusses key concepts and provides contextual information about project management. Sections 2 through 6 provide definitions for each of the five Process Groups and describe the processes within those Process Groups. Sections 2 through 6 also describe the key benefits, inputs, and outputs for each project management process. This standard serves as the foundation and framework for *A Guide to the Project Management Body of Knowledge* (*PMBOK® Guide*).[1] *PMBOK® Guide* expands on the information in this standard by providing a more in-depth description of the context, environment and influences on project management. In addition, the *PMBOK® Guide* provides descriptions of the project management process inputs and outputs, identifies tools and techniques, and discusses key concepts and emerging trends associated with each Knowledge Area.

[1] Project Management Institute. 2017. *A Guide to the Project Management Body of Knowledge (PMBOK® Guide).* Newtown Square, PA: Author.

1.1 PROJECTS AND PROJECT MANAGEMENT

A project is a temporary endeavor undertaken to create a unique product, service, or result. The temporary nature of projects indicates a definite beginning and end. Temporary does not necessarily mean a project has a short duration. A project's end is reached when the objectives have been achieved or when the project is terminated because its objectives will not or cannot be met, or when the need for the project no longer exists. The decision to terminate a project requires approval and authorization by an appropriate authority.

Project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. Project management is accomplished through the appropriate application and integration of the project management processes identified for the project.

Managing a project typically includes but is not limited to:

- Identifying project requirements;
- Addressing the various needs, concerns, and expectations of stakeholders;
- Establishing and maintaining active communication with stakeholders;
- Managing resources; and
- Balancing the competing project constraints, which include but are not limited to:
  - Scope,
  - Schedule,
  - Cost,
  - Quality,
  - Resources, and
  - Risk.

Project circumstances will influence how each project management process is implemented and how the project constraints are prioritized.

1.2 RELATIONSHIPS AMONG PORTFOLIOS, PROGRAMS, AND PROJECTS

A portfolio is defined as projects, programs, subsidiary portfolios, and operations managed in a coordinated manner to achieve strategic objectives. Portfolio management is the centralized management of one or more portfolios to achieve strategic objectives. Portfolio management focuses on ensuring the portfolio is performing consistent with the organization's objectives and evaluating portfolio components to optimize resource allocation. Portfolios may include work that is operational in nature.

A program is defined as related projects, subsidiary programs, and program activities managed in a coordinated manner to obtain benefits not available from managing them individually. Programs include program related work outside the scope of the discrete projects in the program. Program management is the application of knowledge, skills, and principles to a program to achieve the program objectives and to obtain benefits and control not available by managing related program components individually. Programs may also include work that is operational in nature.

Program management supports organizational strategies by authorizing, changing, or terminating projects and managing their interdependencies. Managing project interdependencies may include, among other actions, the following:

- Resolving resource constraints and/or conflicts that affect components within the program;
- Aligning with the organization's strategies that impact and affect program goals and objectives
- Managing issues and employing change management within a shared governance structure;
- Addressing project and program risks that can impact one or more components; and
- Managing program benefits realization by effectively analyzing, sequencing and monitoring component interdependencies.

A project may be managed in three separate scenarios: as a stand-alone project (outside a portfolio or program); within a program; or within a portfolio. Project management has interactions with portfolio and program management when a project is within a portfolio or program.

Figure 1-1 illustrates a sample portfolio structure indicating relationships of the components, shared resources and stakeholders. The portfolio components are grouped together in order to facilitate the effective governance and management of that work and to achieve organizational strategies and priorities. Organizational and portfolio planning impact the components by means of prioritization based on risk, funding, and other considerations. This allows organizations to have an overall view of how the strategic goals are reflected in the portfolio; institute appropriate portfolio, program, and project governance; and authorize human, financial, or physical resources. These resources will be allocated based on expected performance and benefits. Figure 1-1 illustrates that organizational strategies and priorities are linked and have relationships between portfolios and programs, between portfolios and projects, and between programs and individual projects. These relationships are not always strictly hierarchical.

Organizational project management (OPM) is a strategy execution framework utilizing portfolio, program, and project management. It provides a framework that enables organizations to consistently and predictably deliver on organizational strategy, producing better performance, better results, and a sustainable competitive advantage.

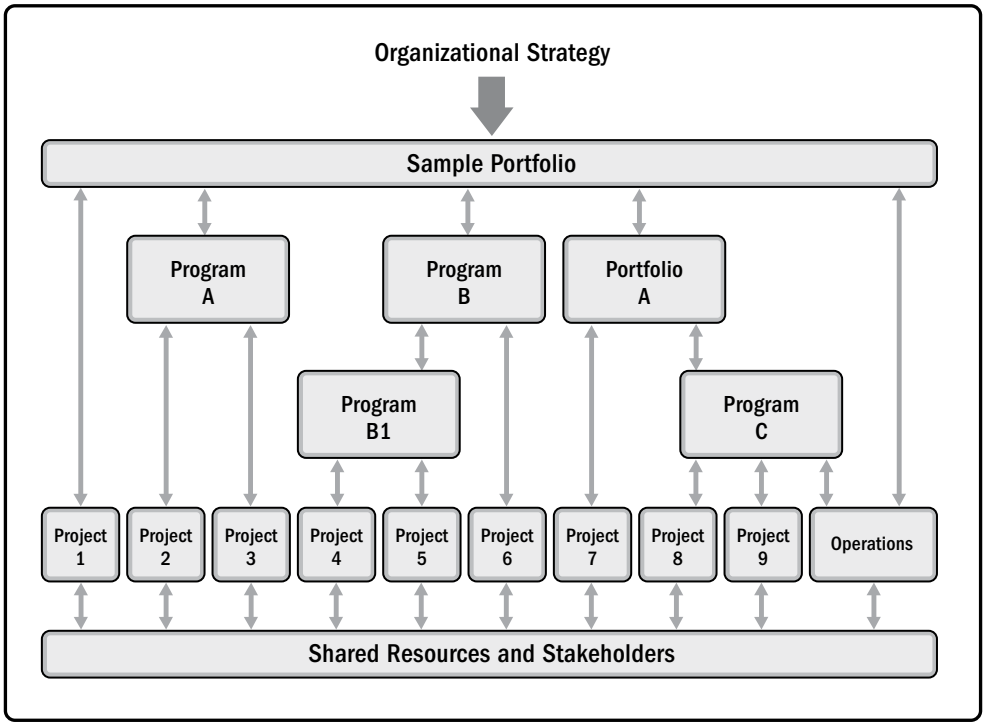


Figure 1-1. Example of Portfolio, Program, and Project Management Interfaces

1.3 LINKING ORGANIZATIONAL GOVERNANCE AND PROJECT GOVERNANCE

There are various types of governance including organizational governance; organizational project management (OPM) governance; and portfolio, program, and project governance. Organizational governance is a structured way to provide direction and control through policies, and processes, to meet strategic and operational goals. Organizational governance is typically conducted by a board of directors to ensure accountability, fairness, and transparency to its stakeholders. Organizational governance principles, decisions, and processes may influence and impact the governance of portfolios, programs, and projects in the following ways:

- Enforcing legal, regulatory, standards, and compliance requirements,
- Defining ethical, social, and environmental responsibilities, and
- Specifying operational, legal, and risk policies.

Project governance is the framework, functions, and processes that guide project management activities in order to create a unique product, service, or result to meet organizational, strategic, and operational goals. Governance at the project level includes:

- Guiding and overseeing the management of project work;
- Ensuring adherence to policies, standards, and guidelines;
- Establishing governance roles, responsibilities, and authorities;
- Decision-making regarding risk escalations, changes, and resources (e.g. team, financial, physical, facilities);
- Ensuring appropriate stakeholder engagement; and
- Monitoring performance.

The project governance framework provides the project stakeholders with structure, processes, roles, responsibilities, accountabilities, and decision-making models for managing the project. Elements of a project governance framework include but are not limited to principles or processes for:

- Stage gate or phase reviews;
- Identifying, escalating, and resolving risks and issues;
- Defining roles, responsibilities, and authorities;
- Process for project knowledge management and capturing lessons learned;
- Decision making, problem solving and escalating topics that are beyond the project manager's authority; and
- Reviewing and approving changes to project, and product changes that are beyond the authority of the project manager.

1.4 PROJECT SUCCESS AND BENEFITS MANAGEMENT

Projects are initiated to realize business opportunities that are aligned with an organization's strategic goals. Prior to initiating a project, a business case is often developed to outline the project objectives, the required investment, and financial and qualitative criteria for project success. The business case provides the basis to measure success and progress throughout the project life cycle by comparing the results with the objectives and the identified success criteria.

Projects are typically initiated as a result of one or more of the following strategic considerations:

- Market demand,
- Strategic opportunity/business need,
- Social need,
- Environmental consideration,
- Customer request,
- Technological advancement,
- Legal or regulatory requirement, and
- Existing or forecasted problem.

A benefits management plan describes how and when the benefits of the project will be delivered and how they will be measured. The benefits management plan may include the following:

- **Target benefits.** The expected tangible and intangible business value to be gained by the implementation of the product, service, or result.
- **Strategic alignment.** How the project benefits support and align with the business strategies of the organization.
- **Timeframe for realizing benefits.** Benefits by phase: short term, long term, and ongoing.
- **Benefits owner.** The accountable person or group that monitors, records, and reports realized benefits throughout the timeframe established in the plan.
- **Metrics.** The direct and indirect measurements used to show the benefits realized.
- **Risks.** Risks associated with achieving target benefits.

The success of the project is measured against the project objectives and success criteria. In many cases, the success of the product, service, or result is not known until sometime after the project is complete. For example, an increase in market share, a decrease in operating expenses, or the success of a new product may not be known when the project is transitioned to operations. In these circumstances, the project management office (PMO), portfolio steering committee, or some other business function within the organization should evaluate the success at a later date to determine if the outcomes met the business objectives.

Both the business case and the benefits management plan are developed prior to the project being initiated. Additionally, both documents are referenced after the project has been completed. Therefore, they are considered business documents rather than project documents or components of the project management plan. As appropriate, these business documents may be inputs to some of the processes involved in managing the project, such as developing the project charter.

1.5 THE PROJECT LIFE CYCLE

A project life cycle is the series of phases that a project passes through from its start to its completion. A project phase is a collection of logically related project activities that culminates in the completion of one or more deliverables. The phases can be sequential, iterative, or overlapping. The names, number, and duration of the project phases are determined by the management and control needs of the organization(s) involved in the project, the nature of the project itself, and its area of application. Phases are time bound, with a start and end or control point (sometimes referred to as a phase review, phase gate, control gate, or other similar term). At the control point, the project charter and business documents are reexamined based on the current environment. At that time, the project's performance is compared to the project management plan to determine if the project should be changed, terminated, or continue as planned.

The project life cycle can be influenced by the unique aspects of the organization, industry, development method, or technology employed. While every project has a start and end, the specific deliverables and work that take place vary widely depending on the project. The life cycle provides the basic framework for managing the project, regardless of the specific work involved.

Though projects vary in size and the amount of complexity they contain, a typical project can be mapped to the following project life cycle structure (see Figure 1-2):

- Starting the project,
- Organizing and preparing,
- Carrying out the work, and
- Closing the project.

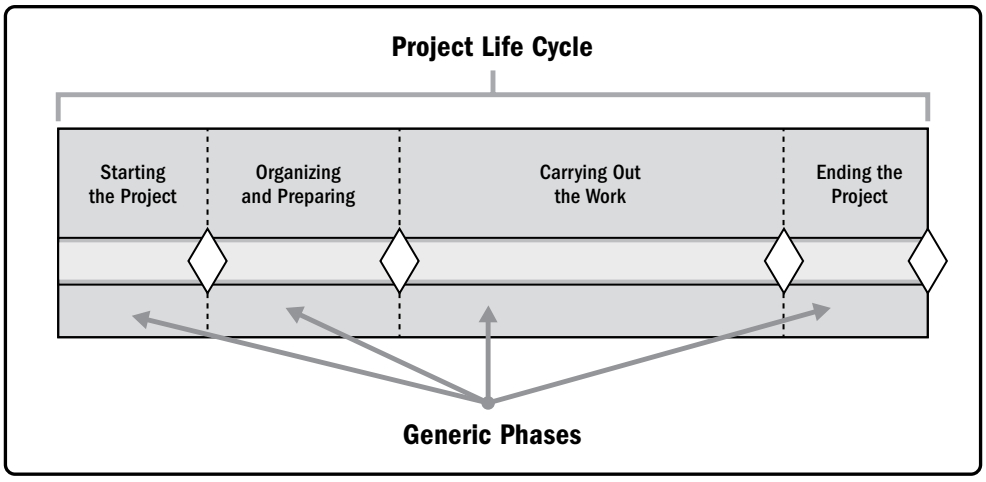


Figure 1-2. Generic Depiction of a Project Life Cycle

A generic life cycle structure typically displays the following characteristics:

- Cost and staffing levels are low at the start, increase as the work is carried out, and drop rapidly as the project draws to a close.
- Risk is greatest at the start of the project as illustrated by Figure 1-3. These factors decrease over the life cycle of the project as decisions are reached and as deliverables are accepted.
- The ability of stakeholders to influence the final characteristics of the project's product, without significantly impacting cost and schedule, is highest at the start of the project and decreases as the project progresses toward completion. Figure 1-3 illustrates the cost of making changes and correcting errors typically increases substantially as the project approaches completion.

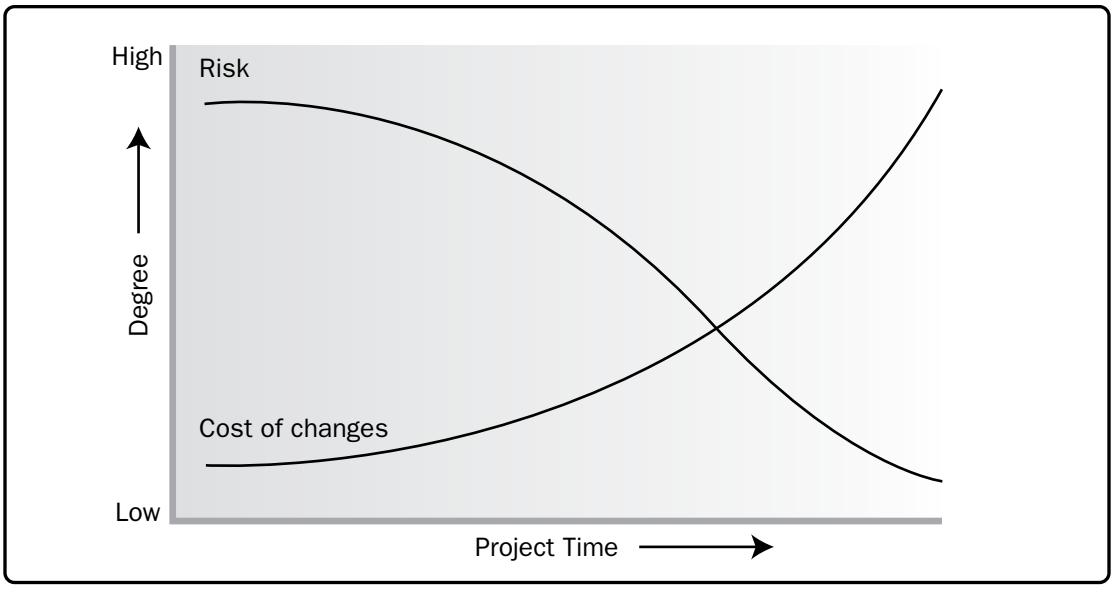


Figure 1-3. Impact of Variables Over Time

1.6 PROJECT STAKEHOLDERS

A stakeholder is an individual, group, or organization that may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project. Project stakeholders may be internal or external to the project, they may be actively involved, passively involved, or unaware of the project. Project stakeholders may have a positive or negative impact on the project, or be positively or negatively impacted by the project. Examples of stakeholders include but are not limited to:

- *Internal stakeholders:*
  - Sponsor,
  - Resource manager,
  - Project management office (PMO),
  - Portfolio steering committee,
  - Program manager,
  - Project managers of other projects, and
  - Team members.
- *External stakeholders:*
  - Customers,
  - End users,
  - Suppliers,
  - Shareholders
  - Regulatory bodies, and
  - Competitors

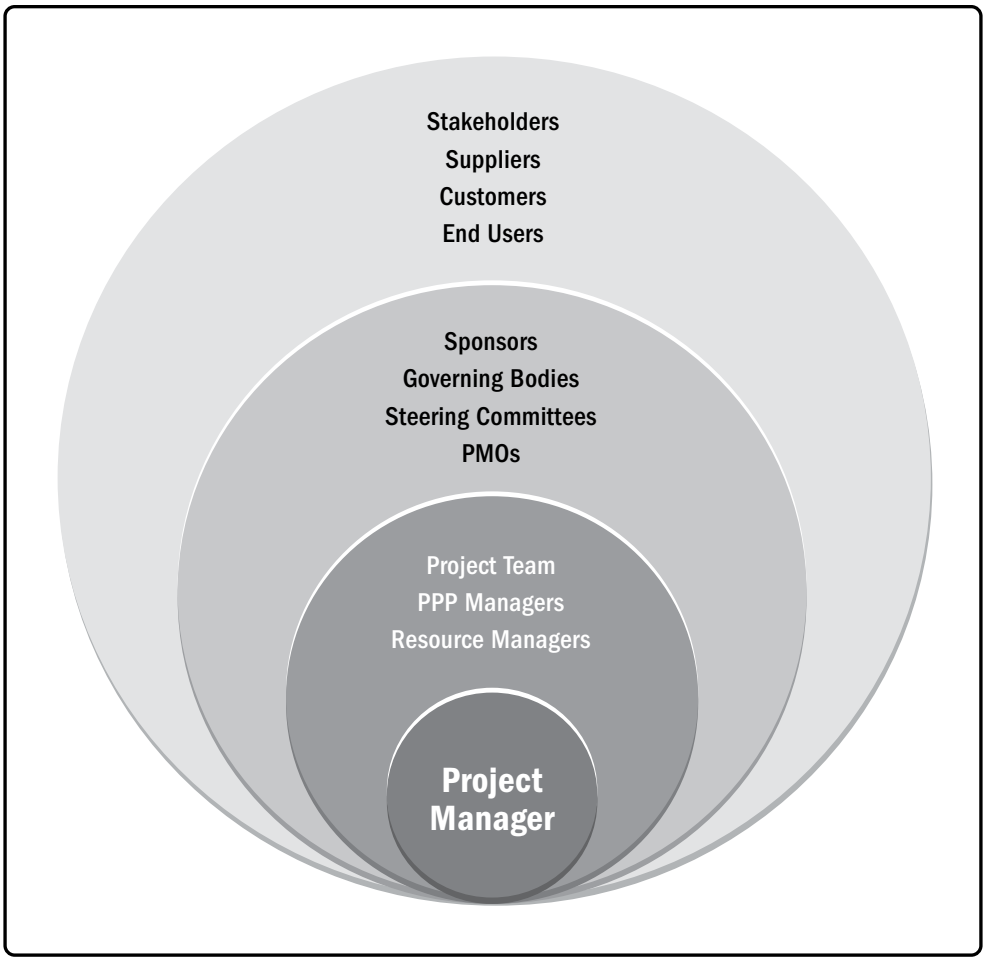


Figure 1-4. Examples of Project Stakeholders

Figure 1-4 shows examples of project stakeholders. Stakeholder involvement may range from occasional contributions in surveys and focus groups to full project sponsorship that includes the provision of financial, political, or other types of support. The type and level of project involvement can change over the course of the project's life cycle. Therefore, successfully identifying, analyzing, and engaging stakeholders and effectively managing their project expectations and participation throughout the project life cycle is critical to project success.

1.7 ROLE OF THE PROJECT MANAGER

The project manager is the person assigned by the performing organization to lead the team responsible for achieving the project objectives. The project manager's reporting relationships are based on the organizational structure and project governance.

In addition to any specific technical skills and general management proficiencies required for the project, project managers should have at least the following attributes:

- Knowledge about project management, the business environment, technical aspects, and other information needed to manage the project effectively;
- Skills needed to effectively lead the project team, coordinate the work, collaborate with stakeholders, solve problems, and make decisions;
- Abilities to develop and manage scope, schedules, budgets, resources, risks, plans, presentations, and reports; and
- Other attributes required to successfully manage the project, such as personality, attitude, ethics, and leadership.

Project managers accomplish work through the project team and other stakeholders. Project managers rely on important interpersonal skills, including, but not limited to:

- Leadership,
- Team building,
- Motivating,
- Communicating,
- Influencing,
- Decision making,
- Political and cultural awareness,
- Negotiating,
- Facilitating,
- Managing conflict, and
- Coaching.

The project manager is successful when the project objectives have been achieved. Another aspect of success is stakeholder satisfaction. The project manager should address stakeholder needs, concerns and expectations to satisfy relevant stakeholders. To be successful, the project manager should tailor the project approach, life cycle, and project management processes to meet the project and product requirements.

1.8 PROJECT MANAGEMENT KNOWLEDGE AREAS

The Project Management Knowledge Areas are fields or areas of specialization that are commonly employed when managing projects. A Knowledge Area is a set of processes associated with a particular topic in project management. These 10 Knowledge Areas are used on most projects most of the time. The needs of a specific project may require additional Knowledge Areas. The 10 Knowledge Areas are:

- **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.
- **Project Scope Management.** Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.
- **Project Schedule Management.** Project Schedule Management includes the processes required to manage the timely completion of the project.
- **Project Cost Management.** Project Cost Management includes the processes involved in planning, estimating, budgeting, financing, funding, managing, and controlling costs so the project can be completed within the approved budget.
- **Project Quality Management.** Project Quality Management includes the processes for incorporating the organization's quality policy regarding planning, managing, and controlling project and product quality requirements, in order to meet stakeholders' expectations.
- **Project Resource Management.** Project Resource Management includes the processes to identify, acquire, and manage the resources needed for the successful completion of the project.
- **Project Communications Management.** Project Communications Management includes the processes required to ensure timely and appropriate planning, collection, creation, distribution, storage, retrieval, management, control, monitoring, and ultimate disposition of project information.
- **Project Risk Management.** Project Risk Management includes the processes of conducting risk management planning, identification, analysis, response planning, response implementation, and monitoring risk on a project.
- **Project Procurement Management.** Project Procurement Management includes the processes necessary to purchase or acquire products, services, or results needed from outside the project team.
- **Project Stakeholder Management.** Project Stakeholder Management includes the processes required to identify the people, groups, or organizations that could impact or be impacted by the project, to analyze stakeholder expectations and their impact on the project, and to develop appropriate management strategies for effectively engaging stakeholders in project decisions and execution.

1.9 PROJECT MANAGEMENT PROCESS GROUPS

This standard describes the project management processes employed to meet project objectives. Project management processes are grouped in five Project Management Process Groups:

- **Initiating Process Group.** The process(es) performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase. Initiating processes are described in Section 2.
- **Planning Process Group.** The process(es) required to establish the scope of the project, refine the objectives, and define the course of action required to attain the objectives that the project was undertaken to achieve. Planning processes are described in Section 3.
- **Executing Process Group.** The process(es) performed to complete the work defined in the project management plan to satisfy the project requirements. Executing processes are described in Section 4.
- **Monitoring and Controlling Process Group.** The process(es) required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes. Monitoring and Controlling processes are described in Section 5.
- **Closing Process Group.** The process(es) performed to formally complete or close a project, phase, or contract. Closing processes are described in Section 6.

These five Process Groups are independent of the application areas, (such as marketing, information services, or accounting) or industry focus (such as construction, aerospace, telecommunications). Individual processes in the Process Groups are often iterated prior to completing a phase or a project. The number of process iterations and interactions between processes varies based on the needs of the project. Processes generally fall into one of three categories:

- **Processes used once or at predefined points in the project.** Developing the project charter and closing the project or phase are examples.
- **Processes that are performed periodically as needed.** Acquiring resources is performed when resources are needed. Conducting procurements will be performed prior to needing the procured item.
- **Processes that are performed continuously throughout the project.** Defining activities may occur throughout the project life cycle, especially when the project uses rolling wave planning or an adaptive development approach. Many of the monitoring and control processes are ongoing from the start of the project, until it is closed out.

The output of one process generally becomes an input to another process or is a deliverable of the project or project phase. For example, the project management plan and project documents (e.g., risk register, responsibility assignment matrix, etc.) produced in the Planning Process Group are provided to the Executing Process Group where updates are made. Figure 1-4 illustrates an example of how Process Groups can overlap during a project or phase.

Process Groups are not project phases. If the project is divided into phases, the processes in the Process Groups interact within each phase. It is possible that all Process Groups could be represented within a phase, as illustrated in Figure 1-5. As projects are separated into distinct phases, such as concept development, feasibility study, design, prototype, build, or test, etc., processes in each of the Process Groups are repeated as necessary in each phase until the completion criteria for that phase have been satisfied.

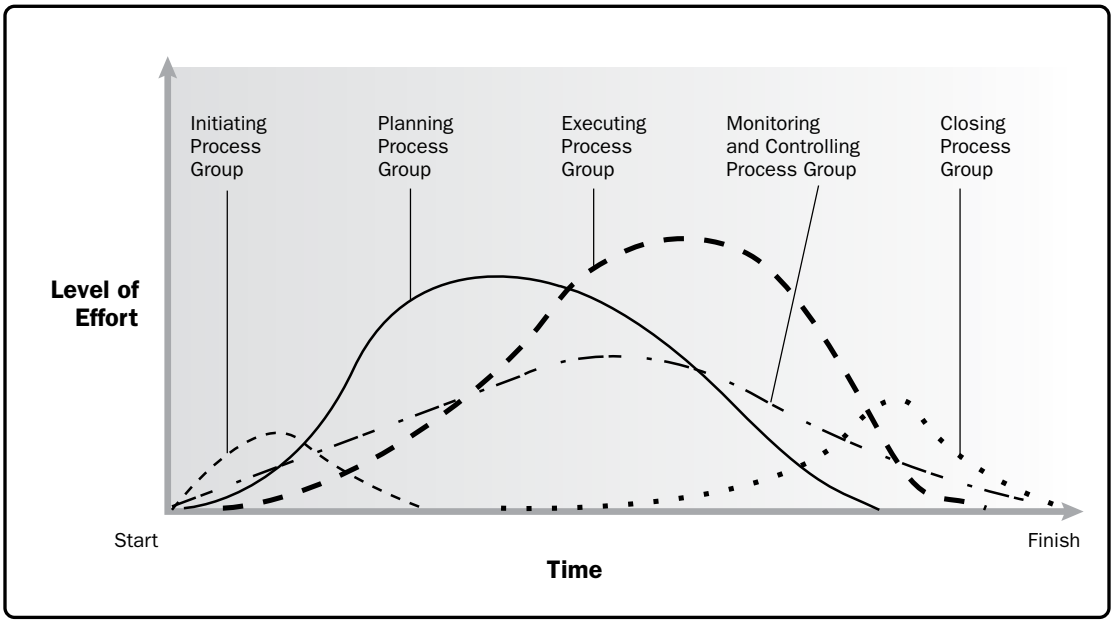


Figure 1-5. Example of Process Group Interactions Within a Project or Phase

Table 1-1 shows the 49 processes mapped to the Process Groups and Knowledge Areas.

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

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

1.10 ENTERPRISE ENVIRONMENTAL FACTORS AND ORGANIZATIONAL PROCESS ASSETS

Projects exist and operate in environments that may have an influence on them. These influences can have a favorable or unfavorable impact on the project. Two major categories of influences are enterprise environmental factors (EEFs) and organizational process assets (OPAs).

EEFs originate from the environment outside of the project and often outside of the enterprise. These factors refer to conditions, which are not under the control of the project team, that influence, constrain, or direct the project. EEFs may have an impact at the enterprise, portfolio, program, or project level. (Refer to Section 2.2 in the *PMBOK® Guide* for additional information on EEFs.) One set of such factors are the internal organizational culture, structure and governance. Examples in this area include but are not limited to: vision, mission, values, beliefs, cultural norms, hierarchy, and authority relationships.

OPAs are internal to the enterprise. These may arise from the enterprise itself, a portfolio, a program, another project, or a combination of these. OPAs are the plans, processes, policies, procedures, and knowledge bases specific to and used by the performing organization. These assets influence the management of the project. Examples include but are not limited to: change control procedures, templates, information from previous projects, and lessons learned repositories. (Refer to Section 2.3 in the *PMBOK® Guide* for additional information on OPAs).

1.11 TAILORING THE PROJECT ARTIFACTS

The term artifact in this context includes project management processes, inputs, tools, techniques, outputs, EEFs, and OPAs. The project manager and the project management team select and adapt the appropriate artifacts for use on their specific project. This selection and adaptation activity is known as tailoring. Tailoring is necessary because each project is unique; therefore, not every process, input, tool, technique, or output is required on every project.

The project management plan is the most prevalent artifact. It has many components, such as the subsidiary management plans, baselines, and a description of the project life cycle. Subsidiary management plans are plans associated with a specific aspect or Knowledge Area of the project, for example, a schedule management plan, risk management plan and change management plan. Part of tailoring is identifying the project management plan components needed for a particular project. The project management plan is an input and project management plan updates are an output of many processes in this standard. Rather than listing the individual project management plan components in the input/output tables, examples of the components that *may* be inputs or *may* be updated as outputs are listed beneath the input/output tables for each process. The possible components are listed as examples only. These inputs and outputs are not required and are not the only inputs or updates to the project management plan that a project manager may use in that particular process.

The project management plan is one of the primary project artifacts, but there are other documents that are not part of the project management plan that are used to manage the project. These other documents are called project documents. Similar to project management plan components, project documents needed for a process will depend on the individual project. The project manager is accountable for identifying the project documents needed for a process and the project documents that will be updated as an output of a process. The project documents listed beneath the input/output tables throughout this standard are possible examples of project documents, not a comprehensive list.

Table 1-2 is a representative list of project management plan components and project documents. It is not complete list, but it does provide a representation of the types of documents that are often used to help manage a project.

Table 1-2. Project Management Plan and Project Documents

Project Management Plan	Project Documents	
1. Scope management plan	1. Activity attributes	19. Quality control measurements
2. Requirements management plan	2. Activity list	20. Quality metrics
3. Schedule management plan	3. Assumption log	21. Quality report
4. Cost management plan	4. Basis of estimates	22. Requirements documentation
5. Quality management plan	5. Change log	23. Requirements traceability matrix
6. Resource management plan	6. Cost estimates	24. Resource breakdown structure
7. Communications management plan	7. Cost forecasts	25. Resource calendars
8. Risk management plan	8. Duration estimates	26. Resource requirements
9. Procurement management plan	9. Issue log	27. Risk register
10. Stakeholder engagement plan	10. Lessons learned register	28. Risk report
11. Change management plan	11. Milestone list	29. Schedule data
12. Configuration management plan	12. Physical resource assignments	30. Schedule forecasts
13. Scope baseline	13. Project calendars	31. Stakeholder register
14. Schedule baseline	14. Project communications	32. Team charter
15. Cost baseline	15. Project schedule	33. Test and evaluation documents
16. Performance measurement baseline	16. Project schedule network diagram	
17. Project life cycle description	17. Project scope statement	
18. Development approach	18. Project team assignments	

Business documents are documents that are generally originated outside of the project, and are used as inputs to the project. Examples of business documents include the business case and benefits management plan. The use of the business documents will depend on the company culture and project initiation process.

The enterprise environmental factors that influence the project and the organizational process assets available to the project will depend on the project and project environment and are not listed in this standard.

2

INITIATING PROCESS GROUP

The Initiating Process Group consists of those processes performed to define a new project or a new phase of an existing project by obtaining authorization to start the project or phase. The purpose of the Initiating Process Group is to align the stakeholders' expectations and the project purpose, inform stakeholders of the scope and objectives, and discuss how their participation in the project and its associated phases can help to ensure their expectations are met. Within the Initiating processes, the initial scope is defined and initial financial resources are committed. Stakeholders who will interact and influence the overall outcome of the project are identified. If not already assigned, the project manager is appointed. This information is captured in the project charter and stakeholder register. When the project charter is approved, the project is officially authorized, and the project manager is authorized to apply organizational resources to project activities.

The key benefits of this Process Group are that only projects that are aligned with the organization's strategic objectives are authorized and that the business case, benefits, and stakeholders are considered from the start of the project. In some organizations, the project manager is involved in developing the business case and defining the benefits. In those organizations, the project manager generally helps write the project charter; in other organizations, the pre-project work is done by the project sponsor, project management office (PMO), portfolio steering committee, or other stakeholder group. This standard assumes the project has been approved by the sponsor or other governing body and they have reviewed the business documents prior to authorizing the project.

Business documents are documents that are generally originated outside of the project, but are used as input to the project. Examples of business documents include the business case, and benefits management plan. Figure 2-1 shows the sponsor and the business documents in relation to the Initiating Processes.

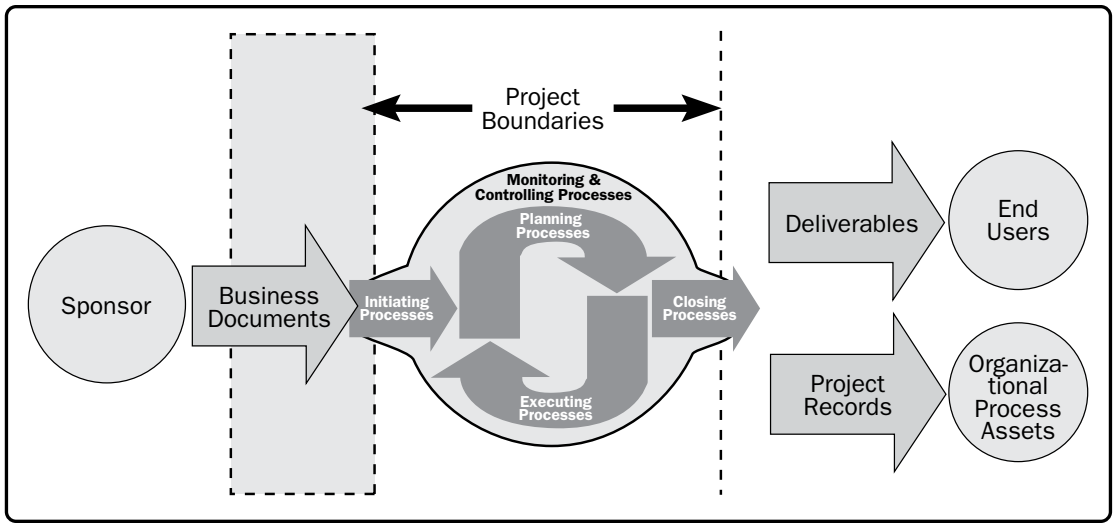


Figure 2-1. Project Boundaries

As described in Section 1.5, projects are often divided into phases. When this is done, information from processes in the Initiating Process Group is reexamined to determine if the information is still valid. Revisiting the Initiating processes at the start of each phase helps keep the project focused on the business need that the project was undertaken to address. The project charter, business documents, and success criteria are verified. The influence, drivers, expectations, and objectives of the project stakeholders are reviewed.

Involving the sponsors, customers, and other stakeholders during initiation creates a shared understanding of success criteria. It also increases the likelihood of deliverable acceptance when the project is complete, and stakeholder satisfaction throughout the project.

The Initiating Process Group includes the project management processes identified in Sections 2.1 through 2.2.

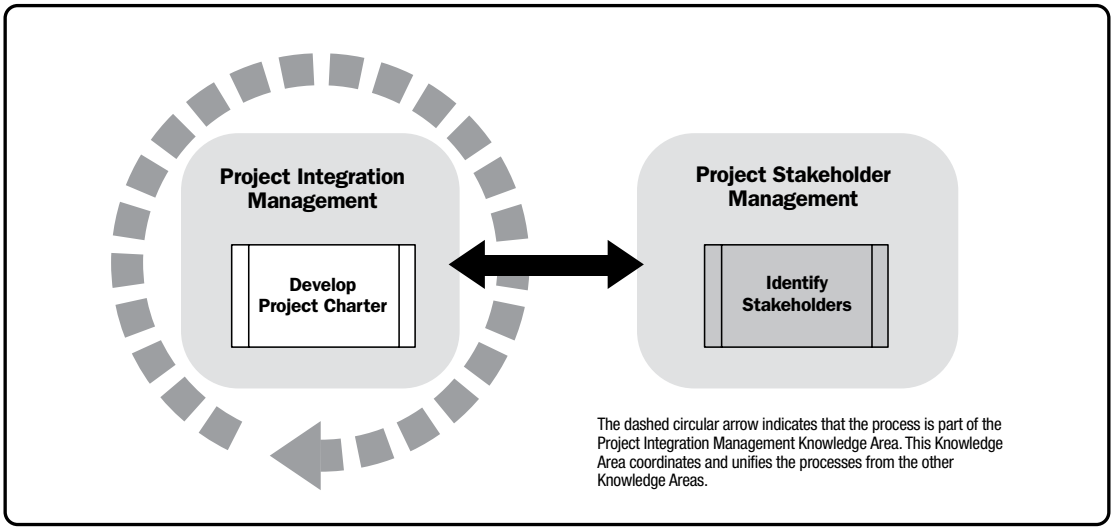


Figure 2-2. Initiating Process Group

2.1 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 benefits of this process are that it provides a direct link between the project and the strategic objectives of the organization, creates a formal record of the project, and shows the organizational commitment to the project. This process is performed once, or at predefined points in the project. The inputs and outputs of this process are shown in Figure 2-3.

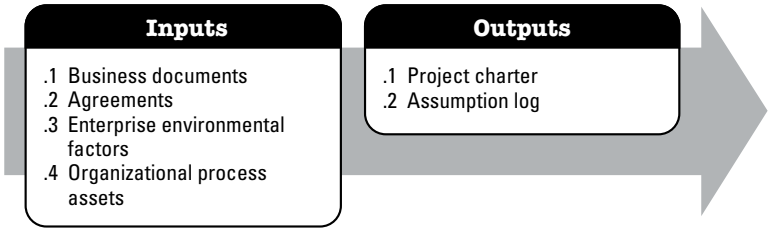


Figure 2-3. Develop Project Charter: Inputs and Outputs

2.2 IDENTIFY STAKEHOLDERS

Identify Stakeholders is the process of identifying project stakeholders regularly and analyzing and documenting relevant information regarding their interests, involvement, interdependencies, influence, and potential impact on project success. The key benefit of this process is that it enables the project team to identify the appropriate focus for engagement of each stakeholder or group of stakeholders. This process is performed periodically throughout the project as needed. The inputs and outputs of this process are depicted in Figure 2-4.

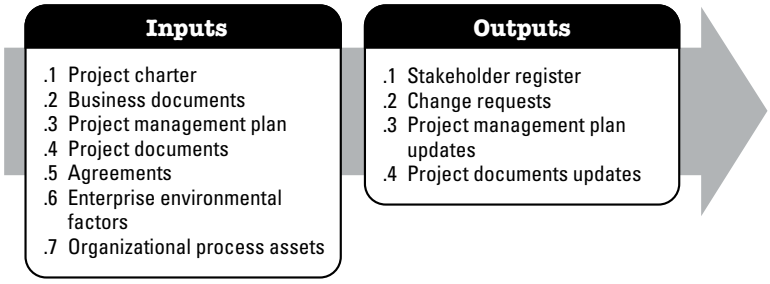


Figure 2-4. Identify Stakeholders: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

2.2.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Communications management plan, and
- Stakeholder engagement plan.

2.2.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Change log,
- Issue log, and
- Requirements documentation.

2.2.3 PROJECT MANAGEMENT PLAN UPDATES

Examples of project management plan components that may be updated as a result of this process include but are not limited to:

- Requirements management plan,
- Communications management plan,
- Risk management plan, and
- Stakeholder engagement plan.

2.2.4 PROJECT DOCUMENTS UPDATES

Examples of project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Issue log, and
- Risk register.

3

PLANNING PROCESS GROUP

The Planning Process Group consists of those processes that establish the total scope of the effort, define and refine the objectives, and develop the course of action required to attain those objectives. The processes in the Planning Process Group develop the components of the project management plan and the project documents used to carry out the project. The nature of a project may require the use of repeated feedback loops for additional analysis. As more project information or characteristics are gathered and understood, additional planning will likely be required. Significant changes that occur throughout the project life cycle may initiate a need to revisit one or more of the planning processes and, possibly, one or both of the Initiating processes. This ongoing refinement of the project management plan is called progressive elaboration, indicating that planning and documentation are iterative or ongoing activities. The key benefit of this Process Group is to define the course of action to successfully complete the project or phase.

The project management team seeks input and encourages involvement from relevant stakeholders while planning the project and developing the project management plan and project documents. When the initial planning effort is completed, the approved version of the project management plan is considered a baseline. Throughout the project, the Monitoring and Controlling processes compare the project performance to the baselines.

The Planning Process Group (Figure 3-1) includes the project management processes identified in Sections 3.1 to 3.24.

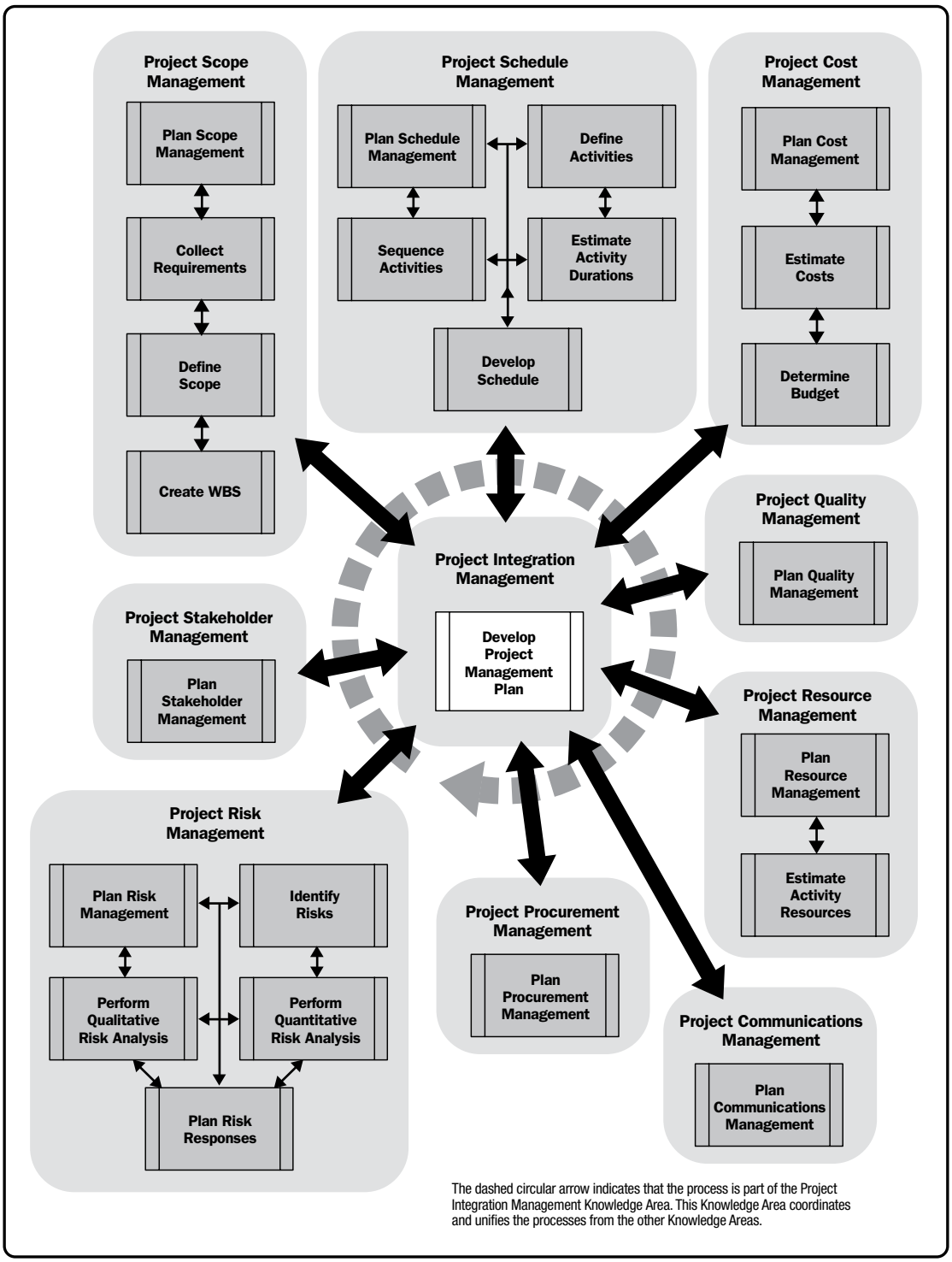


Figure 3-1. Planning Process Group

3.1 DEVELOP PROJECT MANAGEMENT PLAN

Develop Project Management Plan is the process of defining, preparing, and coordinating all plan components and consolidating them into an integrated project management plan. The key benefit of this process is the production of a comprehensive document that defines the basis of all project work and how the work will be performed. This process is performed once or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 3-2.

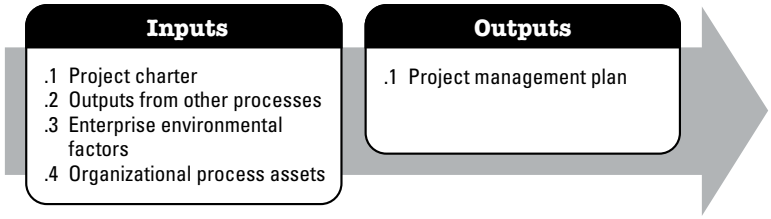


Figure 3-2. Develop Project Management Plan: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.2 PLAN SCOPE MANAGEMENT

Plan Scope Management is the process of creating a scope management plan that documents how the project and product scope will be defined, validated, and controlled. The key benefit of this process is that it provides guidance and direction on how scope will be managed throughout the project. This process is performed once or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 3-3.

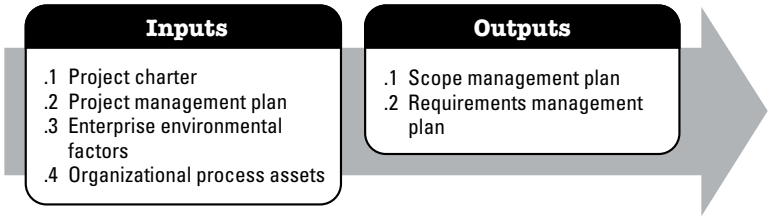


Figure 3-3. Plan Scope Management: Inputs and Outputs

The needs of the project determine which components of the project management plan are necessary.

3.2.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Quality management plan,
- Project life cycle description, and
- Development approach.

3.3 COLLECT REQUIREMENTS

Collect Requirements is the process of determining, documenting, and managing stakeholder needs and requirements to meet objectives. The key benefit of this process is that it provides the basis for defining the product scope and project scope. This process is performed once or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 3-4.

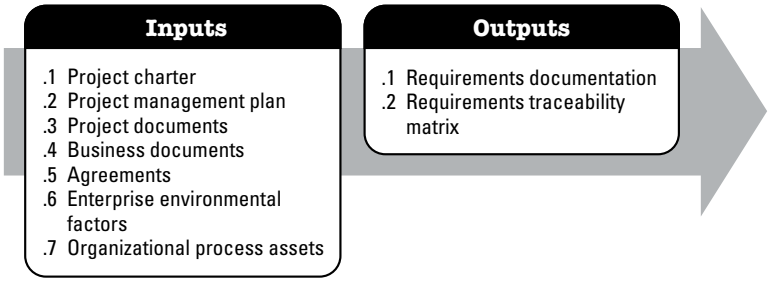


Figure 3-4. Collect Requirements: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.3.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Scope management plan,
- Requirements management plan, and
- Stakeholder engagement plan.

3.3.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Lessons learned register, and
- Stakeholder register.

3.4 DEFINE SCOPE

Define Scope is the process of developing a detailed description of the project and product. The key benefit of this process is that it describes the product, service, or result boundaries and acceptance criteria. This process is performed once or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 3-5.

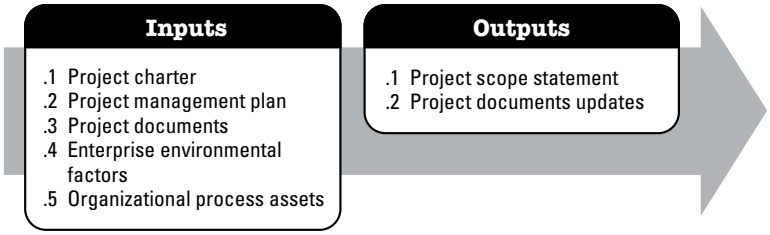


Figure 3-5. Define Scope: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.4.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the scope management plan.

3.4.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Requirements documentation, and
- Risk register.

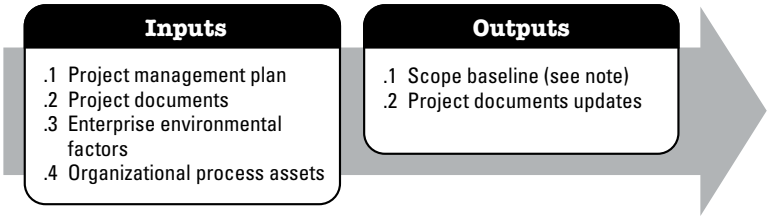
3.4.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Requirements documentation,
- Requirements traceability matrix, and
- Stakeholder register.

3.5 CREATE WBS

Create Work Breakdown Structure (WBS) is the process of subdividing project deliverables and project work into smaller, more manageable components. The key benefit of this process is that it provides a framework of what has to be delivered. This process is performed once or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 3-6.



Note: The scope baseline is the approved version of a scope statement, WBS, and its associated WBS dictionary.

Figure 3-6. Create WBS: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.5.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the scope management plan.

3.5.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Project scope statement, and
- Requirements documentation.

3.5.3 PROJECT DOCUMENTS UPDATES

Project document that may be updated as a result of this process include but is not limited to:

- Assumption log, and
- Requirements documentation.

3.6 PLAN SCHEDULE MANAGEMENT

Plan Schedule Management is the process of establishing the policies, procedures, and documentation for planning, developing, managing, executing, and controlling the project schedule. The key benefit of this process is that it provides guidance and direction on how the project schedule will be managed throughout the project. This process is performed once or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 3-7.

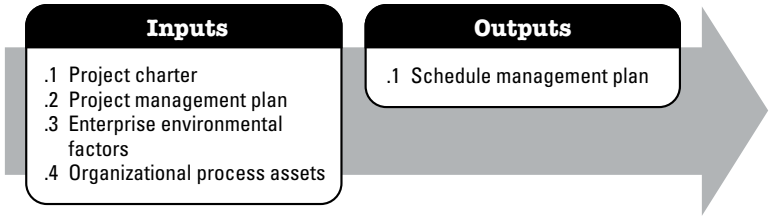


Figure 3-7. Plan Schedule Management: Inputs and Outputs

The needs of the project determine which components of the project management plan are necessary.

3.6.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Scope management plan, and
- Development approach.

3.7 DEFINE ACTIVITIES

Define Activities is the process of identifying and documenting the specific actions to be performed to produce the project deliverables. The key benefit of this process is that it decomposes work packages into schedule activities that provide a basis for estimating, scheduling, executing, monitoring, and controlling the project work. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 3-8.

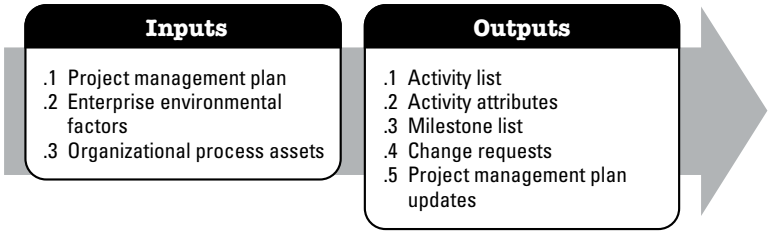


Figure 3-8. Define Activities: Inputs and Outputs

The needs of the project determine which components of the project management plan are necessary.

3.7.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Schedule management plan, and
- Scope baseline.

3.7.2 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Schedule baseline, and
- Cost baseline.

3.8 SEQUENCE ACTIVITIES

Sequence Activities is the process of identifying and documenting relationships among the project activities. The key benefit of this process is that it defines the logical sequence of work to obtain the greatest efficiency given all project constraints. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 3-9.

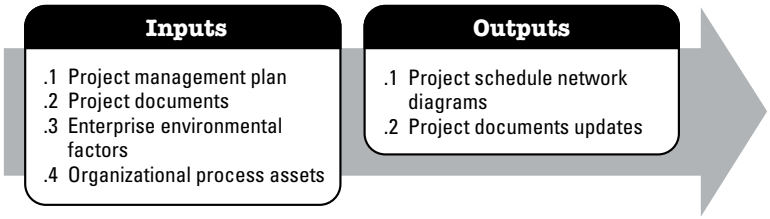


Figure 3-9. Sequence Activities: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.8.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Schedule management plan, and
- Scope baseline.

3.8.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Activity attributes,
- Activity list,
- Assumption log, and
- Milestone list.

3.8.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Activity attributes,
- Activity list,
- Assumption log, and
- Milestone list.

3.9 ESTIMATE ACTIVITY DURATIONS

Estimate Activity Durations is the process of estimating the number of work periods needed to complete individual activities with estimated resources. The key benefit of this process is that it provides the amount of time each activity will take to complete. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 3-10.

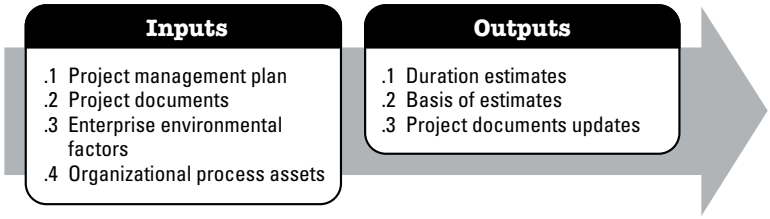


Figure 3-10. Estimate Activity Durations: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.9.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Schedule management plan, and
- Scope baseline.

3.9.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Activity attributes,
- Activity list,
- Assumption log,
- Lessons learned register,
- Milestone list,
- Project team assignments,
- Resource breakdown structure,
- Resource calendars,
- Resource requirements, and
- Risk register.

3.9.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Activity attributes,
- Assumption log,
- Lessons learned register.

3.10 DEVELOP SCHEDULE

Develop Schedule is the process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create a schedule model for project execution and monitoring and controlling. The key benefit of this process is that it generates a schedule model with planned dates for completing project activities. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 3-11.

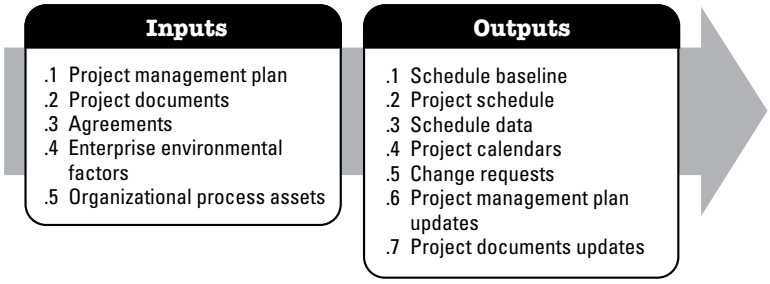


Figure 3-11. Develop Schedule: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.10.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Schedule management plan, and
- Scope baseline.

3.10.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Activity attributes,
- Activity list,
- Assumption log,
- Basis of estimates,
- Duration estimates,
- Lessons learned register,
- Milestone list,
- Project schedule network diagram,
- Project team assignments,
- Resource calendars,
- Resource requirements, and
- Risk register.

3.10.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Schedule management plan, and
- Cost baseline.

3.10.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Activity attributes,
- Assumption log,
- Duration estimates,
- Lessons learned register,
- Resource requirements, and
- Risk register.

3.11 PLAN COST MANAGEMENT

Plan Cost Management is the process of defining how the project costs will be estimated, budgeted, managed, monitored, and controlled. The key benefit of this process is that it provides guidance and direction on how the project costs will be managed throughout the project. This process is performed once, or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 3-12.

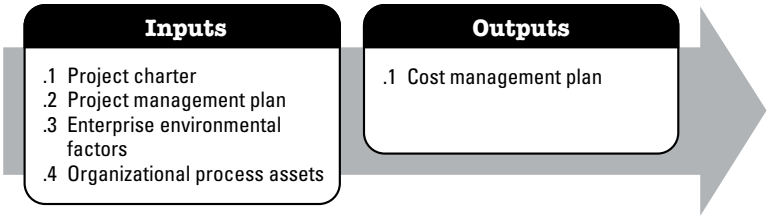


Figure 3-12. Plan Cost Management: Inputs and Outputs

The needs of the project determine which components of the project management plan are necessary.

3.11.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Schedule management plan, and
- Risk management plan.

3.12 ESTIMATE COSTS

Estimate Costs is the process of developing an approximation of the monetary resources needed to complete project work. The key benefit of this process is that it determines the monetary resources required for the project. This process is performed periodically throughout the project as needed. The inputs and outputs of this process are depicted in Figure 3-13.

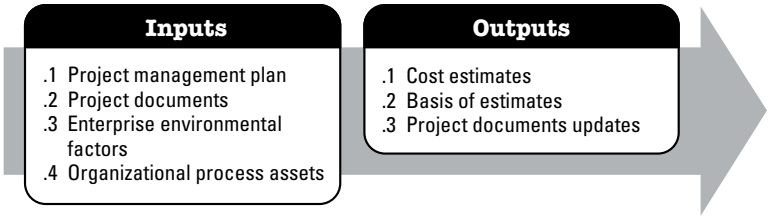


Figure 3-13. Estimate Costs: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.12.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Cost management plan,
- Quality management plan, and
- Scope baseline.

3.12.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Project schedule,
- Resource requirements, and
- Risk register.

3.12.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Lessons learned register, and
- Risk register.

3.13 DETERMINE BUDGET

Determine Budget is the process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline. The key benefit of this process is that it determines the cost baseline against which project performance can be monitored and controlled. This process is performed once or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 3-14.

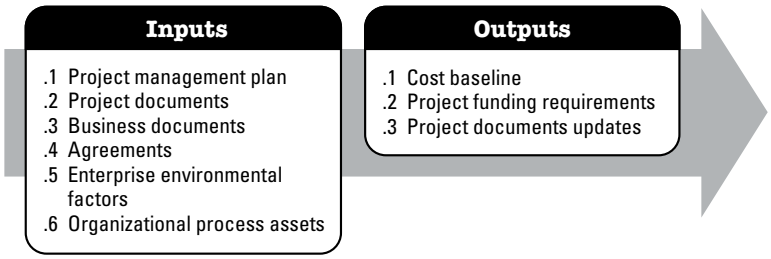


Figure 3-14. Determine Budget: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.13.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Cost management plan,
- Resource management plan, and
- Scope baseline.

3.13.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Basis of estimates,
- Cost estimates,
- Project schedule, and
- Risk register.

3.13.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Cost estimates,
- Project schedule, and
- Risk register.

3.14 PLAN QUALITY MANAGEMENT

Plan Quality Management is the process of identifying quality requirements and/or standards for the project and its deliverables, and documenting how the project will demonstrate compliance with quality requirements and/or standards. The key benefit of this process is that it provides guidance and direction on how quality will be managed and verified throughout the project. This process is performed once or at predefined points in the project. The inputs and outputs of this process are shown in Figure 3-15.

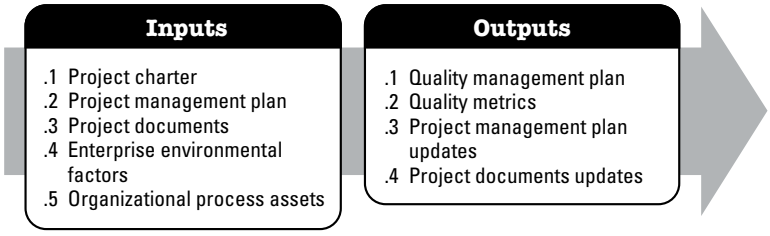


Figure 3-15. Plan Quality Management: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.14.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Requirements management plan,
- Risk management plan,
- Stakeholder engagement plan, and
- Scope baseline.

3.14.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Requirements documentation,
- Requirements traceability matrix,
- Risk register, and
- Stakeholder register.

3.14.3 PROJECT MANAGEMENT PLAN UPDATES

Examples of project management plan components that may be updated as a result of this process include but are not limited to:

- Risk management plan, and
- Scope baseline.

3.14.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Lessons learned register,
- Requirements traceability matrix,
- Risk register, and
- Stakeholder register.

3.15 PLAN RESOURCE MANAGEMENT

Plan Resource Management is the process of defining how to estimate, acquire, manage, and utilize physical and team resources. The key benefit of this process is that it establishes the approach and level of management effort needed for managing project resources based on the type and complexity of the project. This process is performed once or at predefined points in the project. The inputs and outputs of this process are shown in Figure 3-16.

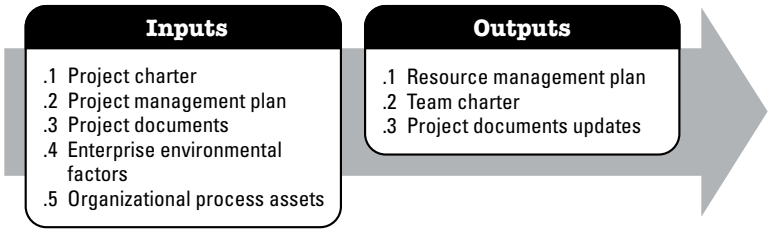


Figure 3-16. Plan Resource Management: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.15.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Quality management plan, and
- Scope baseline.

3.15.2 PROJECT DOCUMENTS

Examples of project documents that may be inputs for this process include but are not limited to:

- Project schedule,
- Requirements documentation,
- Risk register, and
- Stakeholder register.

3.15.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log, and
- Risk register.

3.16 ESTIMATE ACTIVITY RESOURCES

Estimate Activity Resources is the process of estimating team resources and the type and quantities of materials, equipment, and supplies necessary to perform project work. The key benefit of this process is that it identifies the type, quantity, and characteristics of resources required to complete the project. This process is performed periodically throughout the project as needed. The inputs and outputs of this process are depicted in Figure 3-17.

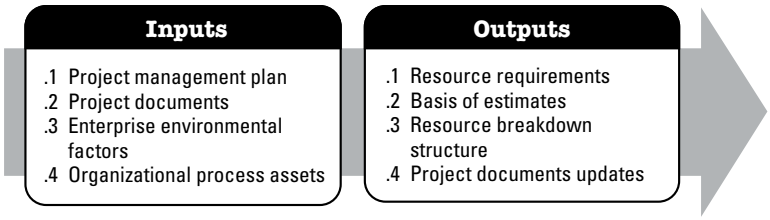


Figure 3-17. Estimate Activity Resources: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.16.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Resource management plan, and
- Scope baseline.

3.16.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Activity attributes,
- Activity list,
- Assumption log,
- Cost estimates,
- Resource calendars, and
- Risk register.

3.16.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Activity attributes,
- Assumption log,
- Lessons learned register.

3.17 PLAN COMMUNICATIONS MANAGEMENT

Plan Communications Management is the process of developing an appropriate approach and plan for project communication activities based on the information needs of each stakeholder or group, available organizational assets, and the needs of the project. The key benefit of this process is a documented approach to effectively and efficiently engage stakeholders by presenting relevant information in a timely manner. This process is performed periodically throughout the project as needed. The inputs and outputs of this process are depicted in Figure 3-18.

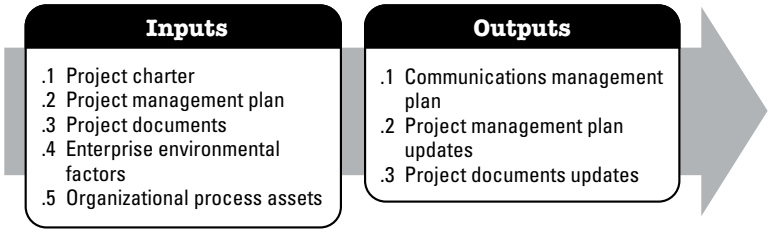


Figure 3-18. Plan Communications Management: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.17.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Resource management plan, and
- Stakeholder engagement plan.

3.17.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Requirements documentation, and
- Stakeholder register.

3.17.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to the stakeholder engagement plan.

3.17.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Project schedule, and
- Stakeholder register.

3.18 PLAN RISK MANAGEMENT

Plan Risk Management is the process of defining how to conduct risk management activities for a project. The key benefit of this process is that it ensures that the degree, type, and visibility of risk management are proportionate to both the risks and the importance of the project to the organization and other stakeholders. This process is performed once or at predefined points in the project. The inputs and output of this process are depicted in Figure 3-19.

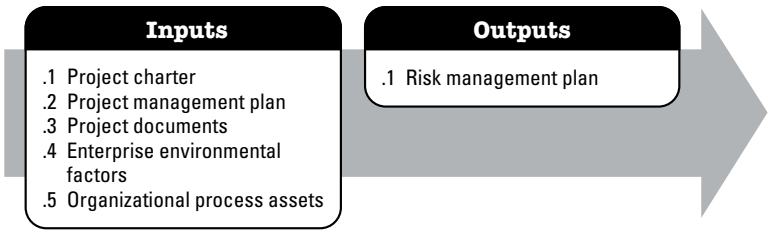


Figure 3-19. Plan Risk Management: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.18.1 PROJECT MANAGEMENT PLAN COMPONENTS

In planning Project Risk Management, all available components of the project management plan should be taken into consideration in order to ensure risk management is consistent with the needs of the project.

3.18.2 PROJECT DOCUMENTS EXAMPLES

An example of a project document that may be an input for this process includes but is not limited to the stakeholder register.

3.19 IDENTIFY RISKS

Identify Risks is the process of identifying individual project risks as well as sources of overall project risk, and documenting their characteristics. The key benefit of this process is the documentation of the existing individual project risks and the sources of overall project risk. It also brings together information so the project team can to respond appropriately to the identified risks. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 3-20.

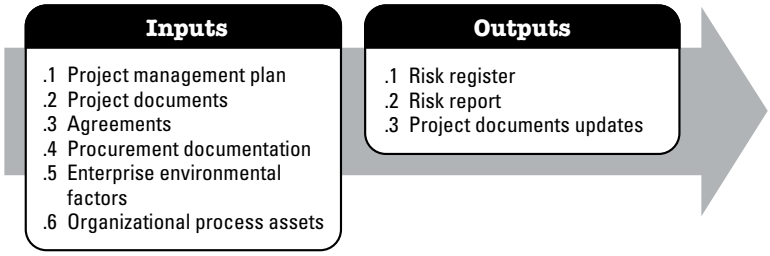


Figure 3-20. Identify Risks: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.19.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Requirements management plan,
- Schedule management plan,
- Cost management plan,
- Quality management plan,
- Resource management plan,
- Risk management plan,
- Scope baseline,
- Schedule baseline, and
- Cost baseline.

3.19.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Cost estimates,
- Duration estimates,
- Issue log,
- Lessons learned register,
- Requirements documentation,
- Resource requirements, and
- Stakeholder register.

3.19.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Issue log, and
- Lessons learned register.

3.20 PERFORM QUALITATIVE RISK ANALYSIS

Perform Qualitative Risk Analysis is the process of prioritizing individual project risks for further analysis or action by assessing their probability of occurrence and impact as well as other characteristics. The key benefit of this process is that it focuses efforts on high-priority risks. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 3-21.

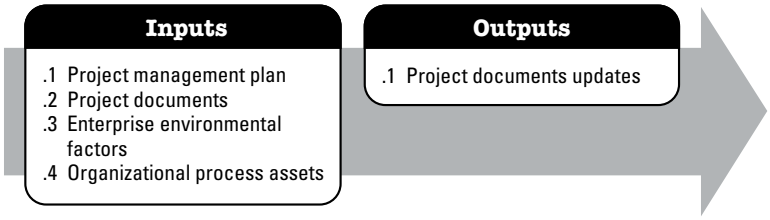


Figure 3-21. Perform Qualitative Risk Analysis: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.20.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the risk management plan.

3.20.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Risk register, and
- Stakeholder register.

3.20.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Issue log,
- Risk register, and
- Risk report.

3.21 PERFORM QUANTITATIVE RISK ANALYSIS

Perform Quantitative Risk Analysis is the process of numerically analyzing the combined effect of identified individual project risks and other sources of uncertainty on overall project objectives. The key benefit of this process is that it quantifies overall project risk exposure and can also provide additional quantitative risk information to support risk response planning. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 3-22.

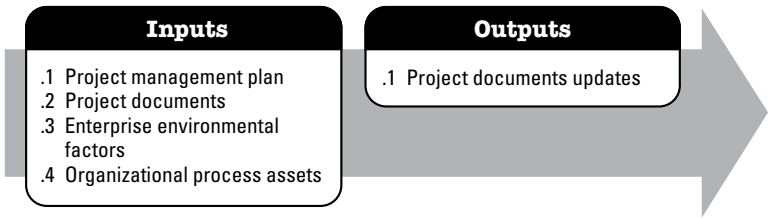


Figure 3-22. Perform Quantitative Risk Analysis: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.21.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Risk management plan,
- Scope baseline,
- Schedule baseline, and
- Cost baseline.

3.21.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Basis of estimates,
- Cost estimates,
- Cost forecasts,
- Duration estimates,
- Milestone list,
- Resource requirements,
- Risk register,
- Risk report, and
- Schedule forecasts.

3.21.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to the risk report.

3.22 PLAN RISK RESPONSES

Plan Risk Responses is the process of developing options, selecting strategies, and agreeing on actions to address overall project risk exposure as well as to treat individual project risks. The key benefit of this process is that it identifies appropriate ways to address overall project risk and individual project risks. This process also allocates resources and inserts activities into project documents and the project management plan as needed. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 3-23.

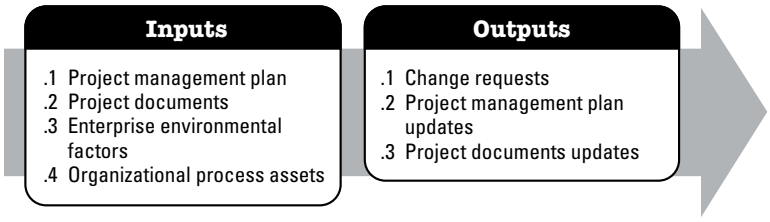


Figure 3-23. Plan Risk Responses: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.22.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Resource management plan,
- Risk management plan, and
- Cost baseline.

3.22.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Project schedule,
- Project team assignments,
- Resource calendars,
- Risk register,
- Risk report, and
- Stakeholder register.

3.22.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Schedule management plan,
- Cost management plan,
- Quality management plan,
- Resource management plan,
- Procurement management plan,
- Scope baseline,
- Schedule baseline, and
- Cost baseline.

3.22.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Cost forecasts,
- Lessons learned register,
- Project schedule,
- Project team assignments,
- Risk register, and
- Risk report.

3.23 PLAN PROCUREMENT MANAGEMENT

Plan Procurement Management is the process of documenting project procurement decisions, specifying the approach, and identifying potential sellers. The key benefit of this process is that it determines whether to acquire goods and services from outside the project and, if so, what to acquire as well as how and when to acquire it. Goods and services may be procured from other parts of the performing organization or from external sources. This process is performed once or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 3-24.

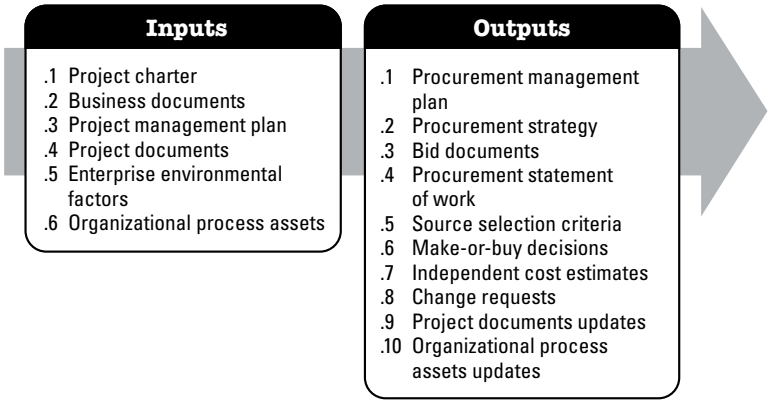


Figure 3-24. Plan Procurement Management: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.23.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Scope management plan,
- Quality management plan,
- Resource management plan, and
- Scope baseline.

3.23.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Milestone list,
- Project team assignments,
- Requirements documentation,
- Requirements traceability matrix,
- Resource requirements,
- Risk register, and
- Stakeholder register.

3.23.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Lessons learned register,
- Milestone list,
- Requirements documentation,
- Requirements traceability matrix,
- Risk register, and
- Stakeholder register.

3.24 PLAN STAKEHOLDER ENGAGEMENT

Plan Stakeholder Engagement is the process of developing approaches to involve project stakeholders based on their needs, expectations, interests, and potential impact on the project. The key benefit is that it provides an actionable plan to interact with stakeholders effectively. This process is performed periodically throughout the project as needed. The inputs and outputs of this process are depicted in Figure 3-25.

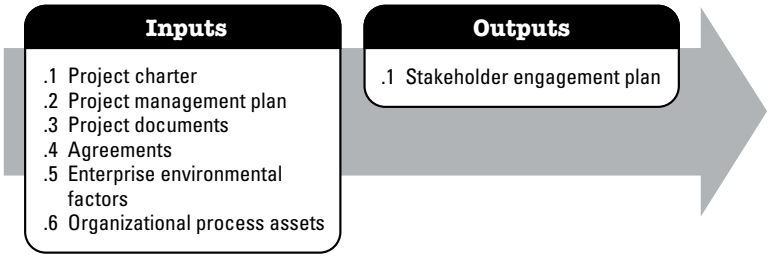


Figure 3-25. Plan Stakeholder Engagement: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

3.24.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Resource management plan,
- Communications management plan, and
- Risk management plan.

3.24.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Change log,
- Issue log,
- Project schedule,
- Risk register, and
- Stakeholder register.

4

EXECUTING PROCESS GROUP

The Executing Process Group consists of those processes performed to complete the work defined in the project management plan to satisfy the project requirements. This Process Group involves coordinating resources, managing stakeholder engagement, and integrating and performing the activities of the project in accordance with the project management plan. The key benefit of this Process Group is that the work needed to meet the project requirements and objectives is performed according to plan. A large portion of the project budget, resources, and time is expended in performing the Executing Process Group processes. The processes in the Executing Process Group may generate change requests. If approved, the change requests may trigger one or more planning processes that result in a modified management plan, project documents, and possibly new baselines. The Executing Process Group (Figure 4-1) includes the project management processes identified in Sections 4.1 through 4.10.

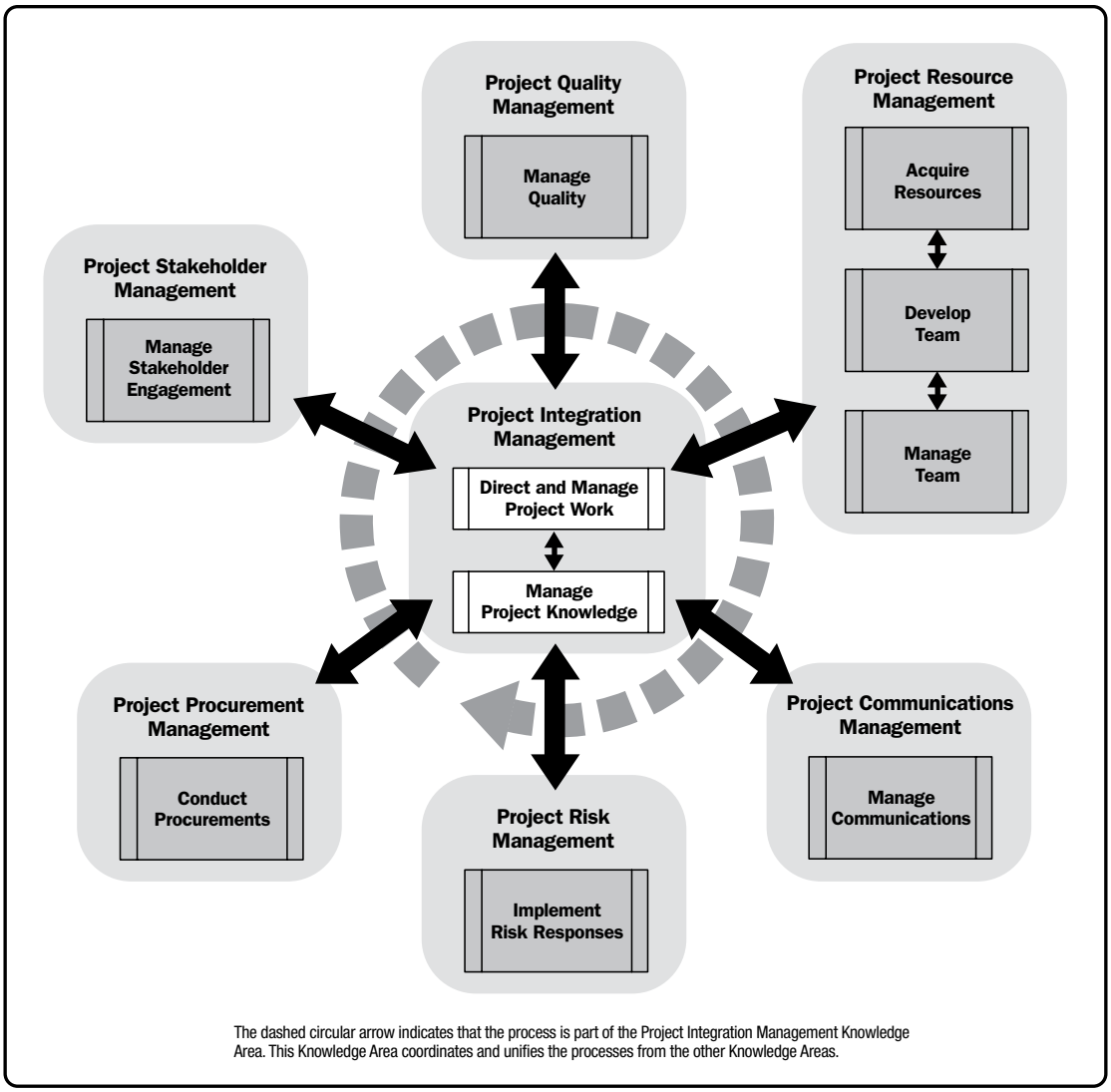


Figure 4-1. Executing Process Group

4.1 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 and deliverables, thus improving the probability of project success. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 4-2.

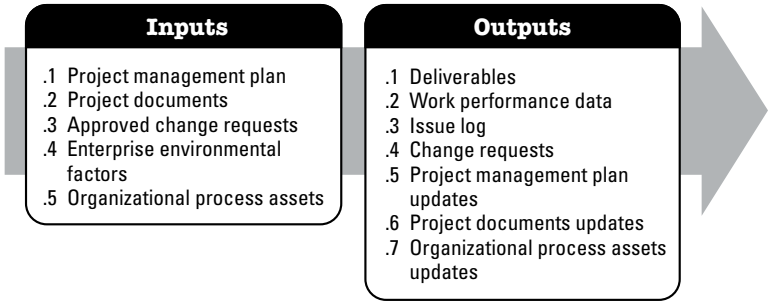


Figure 4-2. Direct and Manage Project Work: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.1.1 PROJECT MANAGEMENT PLAN COMPONENTS

Any component of the project management plan may be an input for this process.

4.1.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Change log,
- Lessons learned register,
- Milestone list,
- Project communications,
- Project schedule,
- Requirements traceability matrix,
- Risk register, and
- Risk report.

4.1.3 PROJECT MANAGEMENT PLAN UPDATES

Any component of the project management plan may be updated as a result of this process.

4.1.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Activity list,
- Assumption log,
- Lessons learned register,
- Requirements documentation,
- Risk register, and
- Stakeholder register.

4.2 MANAGE PROJECT KNOWLEDGE

Manage Project Knowledge is the process of using existing knowledge and creating new knowledge to achieve the project's objectives and contribute to organizational learning. The key benefits of this process are that prior organizational knowledge is leveraged to produce or improve the project outcomes and that knowledge created by the project is available to support organizational operations and future projects or phases. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 4-3.

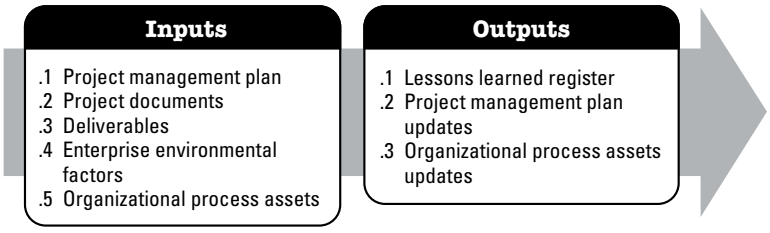


Figure 4-3. Manage Project Knowledge: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.2.1 PROJECT MANAGEMENT PLAN COMPONENTS

All components of the project management plan may be inputs for this process.

4.2.2 PROJECT DOCUMENTS

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Project team assignments,
- Resource breakdown structure,
- Source selection criteria, and
- Stakeholder register.

4.2.3 PROJECT MANAGEMENT PLAN UPDATES

Any component of the project management plan may be updated as a result of this process.

4.3 MANAGE QUALITY

Manage Quality is the process of translating the quality management plan into executable quality activities that incorporate the organization's quality policies into the project. The key benefit of this process is that it increases the probability of meeting the quality objectives, as well as identifying ineffective processes and causes of poor quality. This process is performed throughout the project. The inputs and outputs of this process are shown in Figure 4-4.

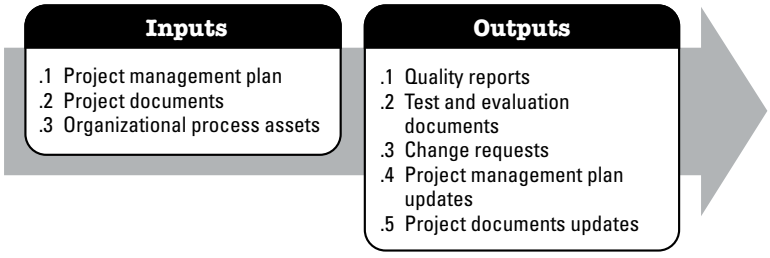


Figure 4-4. Manage Quality: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.3.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the quality management plan.

4.3.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Quality control measurements,
- Quality metrics, and
- Risk report.

4.3.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Quality management plan,
- Scope baseline,
- Schedule baseline,
- Cost baseline.

4.3.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Issue log,
- Lessons learned register, and
- Risk register.

4.4 ACQUIRE RESOURCES

Acquire Resources is the process of obtaining team members, facilities, equipment, materials, supplies, and other resources necessary to complete project work. The key benefit of this process is that it outlines and guides the selection of resources and assigns them to their respective activities. This process is performed periodically throughout the project as needed. The inputs and outputs of this process are shown in Figure 4-5.

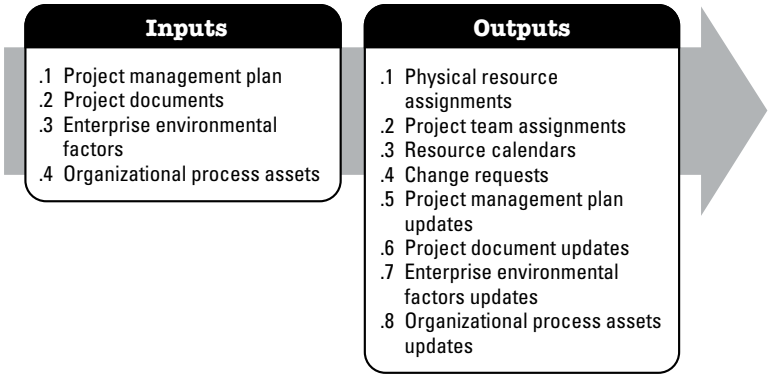


Figure 4-5. Acquire Resources: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.4.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Resource management plan,
- Procurement management plan, and
- Cost baseline.

4.4.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Project schedule
- Resource calendars,
- Resource requirements, and
- Stakeholder register.

4.4.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Resource management plan, and
- Cost baseline.

4.4.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Lessons learned register,
- Project schedule,
- Resource breakdown structure,
- Resource calendars,
- Resource requirements,
- Risk register, and
- Stakeholder register.

4.5 DEVELOP TEAM

Develop Team is the process of improving competencies, team member interaction, and overall team environment to enhance project performance. The key benefit of this process is that it results in improved teamwork, enhanced interpersonal skills and competencies, motivated employees, reduced attrition, and improved overall project performance. This process is performed throughout the project. The inputs and outputs of this process are shown in Figure 4-6.

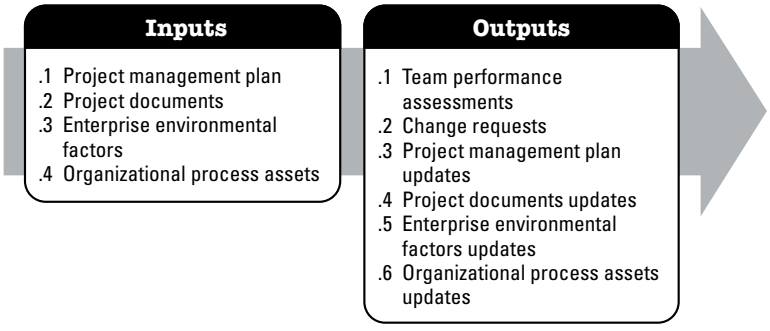


Figure 4-6. Develop Team: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.5.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the resource management plan.

4.5.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Project schedule,
- Project team assignments,
- Resource calendars, and
- Team charter.

4.5.3 PROJECT MANAGEMENT PLAN UPDATES

A component of the project management plan that may be updated as a result of this process includes but is not limited to the resource management plan.

4.5.4 PROJECT DOCUMENTS UPDATES

A project document that may be updated as a result of this process includes but is not limited to:

- Lessons learned register,
- Project schedule,
- Project team assignments,
- Resource calendars, and
- Team charter.

4.6 MANAGE TEAM

Manage Team is the process of tracking team member performance, providing feedback, resolving issues, and managing team changes to optimize project performance. The key benefit of this process is that it influences team behavior, manages conflict, and resolves issues. This process is performed throughout the project. The inputs and outputs of this process are shown in Figure 4-7.

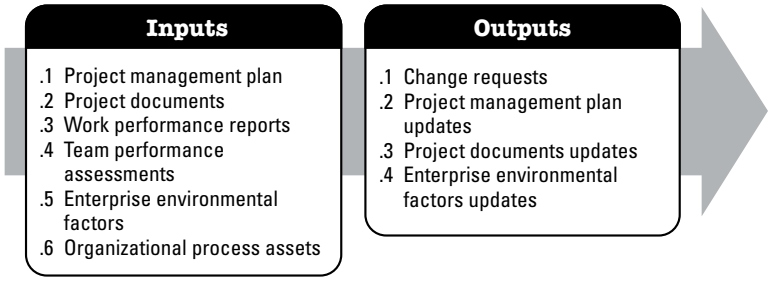


Figure 4-7. Manage Team: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.6.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the resource management plan.

4.6.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Issue log,
- Lessons learned register,
- Project team assignments, and
- Team charter.

4.6.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Resource management plan,
- Schedule baseline, and
- Cost baseline.

4.6.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Issue log,
- Lessons learned register, and
- Project team assignments.

4.7 MANAGE COMMUNICATIONS

Manage Communications is the process of ensuring timely and appropriate collection, creation, distribution, storage, retrieval, management, monitoring, and the ultimate disposition of project information. The key benefit of this process is that it enables an efficient and effective information flow between the project team and the stakeholders. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 4-8.

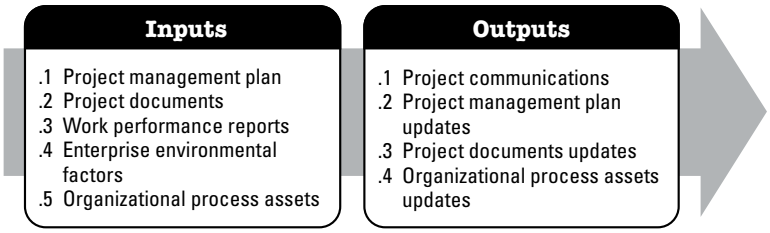


Figure 4-8. Manage Communications: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.7.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Resource management plan,
- Communications management plan, and
- Stakeholder engagement plan.

4.7.2 PROJECT DOCUMENTS EXAMPLE

Examples of project documents that may be inputs for this process include but are not limited to:

- Change log,
- Issue log,
- Lessons learned register,
- Quality report,
- Risk report, and
- Stakeholder register.

4.7.3 PROJECT MANAGEMENT PLAN UPDATES

Examples of the project management plan components that may be updated as a result of this process include but are not limited to:

- Communications management plan, and
- Stakeholder engagement plan.

4.7.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Issue log,
- Lessons learned register,
- Project schedule,
- Risk register, and
- Stakeholder register.

4.8 IMPLEMENT RISK RESPONSES

Implement Risk Responses is the process of implementing agreed-upon risk response plans. The key benefit of this process is that it ensures that agreed-upon risk responses are executed as planned in order to address overall project risk exposure, as well as to minimize individual project threats and maximize individual project opportunities. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 4-9.

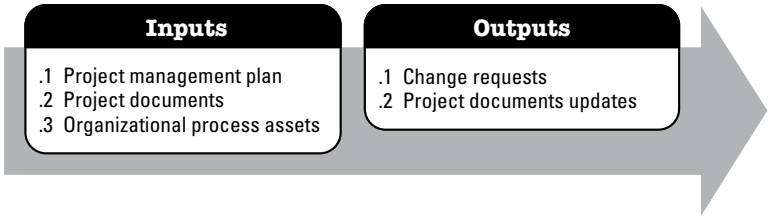


Figure 4-9. Implement Risk Responses: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.8.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the risk management plan.

4.8.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Risk register, and
- Risk report.

4.8.3 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Issue log,
- Lessons learned register,
- Project team assignments,
- Risk register, and
- Risk report.

4.9 CONDUCT PROCUREMENTS

Conduct Procurements is the process of obtaining seller responses, selecting a seller, and awarding a contract. The key benefit of this process is that it selects a qualified seller and implements the legal agreement for delivery. This process is performed periodically throughout the project as needed. The inputs and outputs of this process are depicted in Figure 4-10.

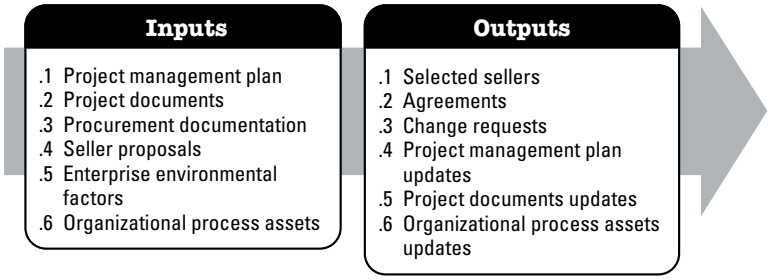


Figure 4-10. Conduct Procurements: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.9.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Scope management plan,
- Requirements management plan,
- Communications management plan,
- Risk management plan,
- Procurement management plan,
- Configuration management plan, and
- Cost baseline.

4.9.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Project schedule,
- Requirements documentation,
- Risk register, and
- Stakeholder register.

4.9.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Requirements management plan,
- Quality management plan,
- Communications management plan,
- Risk management plan,
- Procurement management plan,
- Scope baseline,
- Schedule baseline, and
- Cost baseline.

4.9.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Lessons learned register,
- Requirements documentation,
- Requirements traceability matrix,
- Resource calendars,
- Risk register, and
- Stakeholder register.

4.10 MANAGE STAKEHOLDER ENGAGEMENT

Manage Stakeholder Engagement is the process of communicating and working with stakeholders to meet their needs and expectations, address issues, and foster appropriate stakeholder involvement. The key benefit of this process is that it allows the project manager to increase support and minimize resistance from stakeholders. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 4-11.

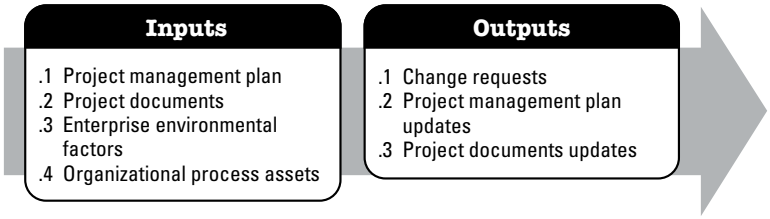


Figure 4-11. Manage Stakeholder Engagement: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

4.10.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Communications management plan,
- Risk management plan,
- Stakeholder engagement plan, and
- Change management plan.

4.10.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Change log,
- Issue log,
- Lessons learned register, and
- Stakeholder register.

4.10.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Communications management plan, and
- Stakeholder engagement plan.

4.10.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Change log,
- Issue log,
- Lessons learned register, and
- Stakeholder register.

5

MONITORING AND CONTROLLING PROCESS GROUP

The Monitoring and Controlling Process Group consists of those processes required to track, review, and regulate the progress and performance of the project; identify any areas in which changes to the plan are required; and initiate the corresponding changes. Monitoring is collecting project performance data, producing performance measures, and reporting and disseminating performance information. Controlling is comparing actual performance with planned performance, analyzing variances, assessing trends to effect process improvements, evaluating possible alternatives, and recommending appropriate corrective action as needed. The key benefit of this Process Group is that project performance is measured and analyzed at regular intervals, appropriate events, or when exception conditions occur in order to identify and correct variances from the project management plan. The Monitoring and Controlling Process Group also involves:

- Evaluating change requests and deciding on the appropriate response;
- Recommending corrective or preventive action in anticipation of possible problems;
- Monitoring the ongoing project activities against the project management plan and project baselines; and
- Influencing the factors that could circumvent the change control process so only approved changes are implemented.

Continuous monitoring provides the project team and other stakeholders with insight into the status of the project and identifies any areas that require additional attention. The Monitoring and Controlling Process Group monitors and controls the work being done within each Knowledge Area, each Process Group, each life cycle phase, and the project as a whole. The Monitoring and Controlling Process Group (Figure 5-1) includes the project management processes identified in Sections 5.1 through 5.12.

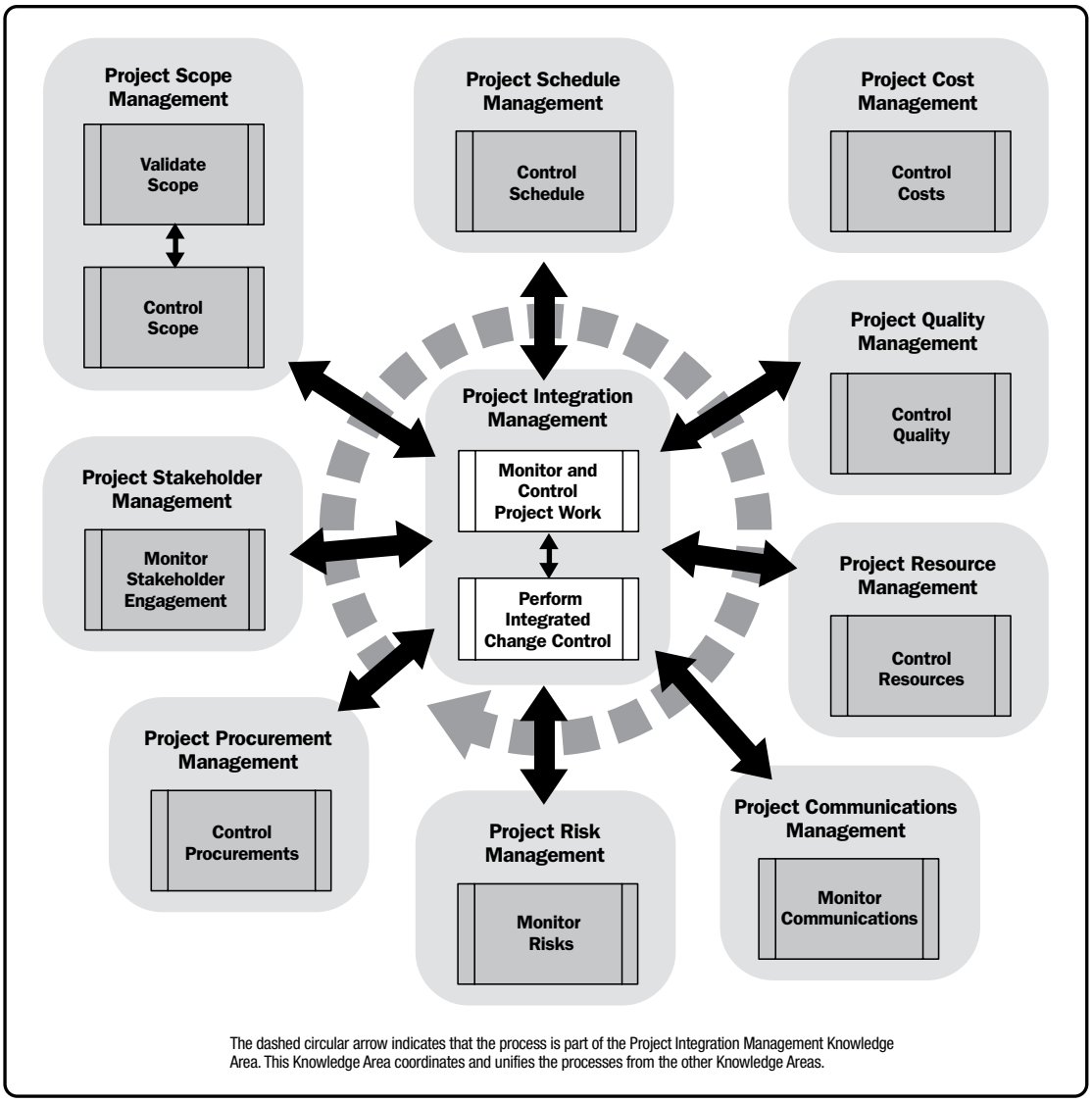


Figure 5-1. Monitoring and Controlling Process Group

5.1 MONITOR AND CONTROL PROJECT WORK

Monitor and Control Project Work is the process of tracking, reviewing, and reporting the overall 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, to recognize the actions taken to address any performance issues, and to have visibility into the future project status with cost and schedule forecasts. This process is performed throughout the project. The inputs and outputs for this process are depicted in Figure 5-2.

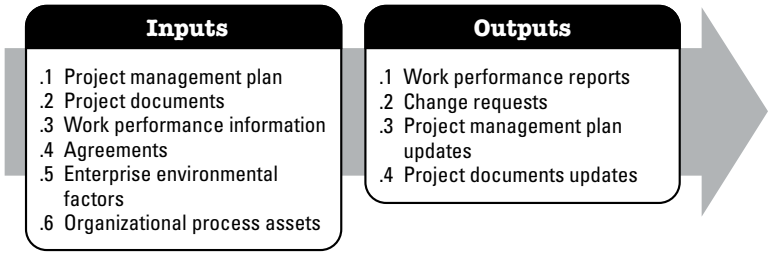


Figure 5-2. Monitor and Control Project Work: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.1.1 PROJECT MANAGEMENT PLAN COMPONENTS

Any component of the project management plan may be an input for this process.

5.1.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Basis of estimates,
- Cost forecasts,
- Issue log,
- Lessons learned register,
- Milestone list,
- Quality reports,
- Risk register,
- Risk report, and
- Schedule forecasts.

5.1.3 PROJECT MANAGEMENT PLAN UPDATES

Any component of the project management plan may be updated as a result of this process.

5.1.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Cost forecasts,
- Issue log,
- Lessons learned register,
- Risk register, and
- Schedule forecasts.

5.2 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 the decisions. This process reviews all requests for changes to project documents, deliverables, or the project management plan, and determines the resolution of the change requests. The key benefit of this process is that it allows for documented changes within the project to be considered in an integrated manner while addressing overall project risk, which often arises from changes made without consideration of the overall project objectives or plans. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 5-3.

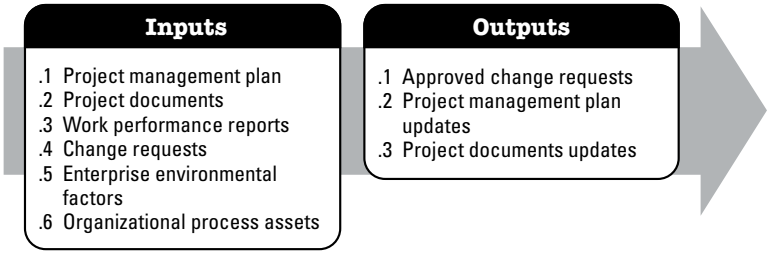


Figure 5-3. Perform Integrated Change Control: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.2.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Change management plan,
- Configuration management plan,
- Scope baseline,
- Schedule baseline, and
- Cost baseline.

5.2.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Basis of estimates,
- Requirements traceability matrix, and
- Risk report.

5.2.3 PROJECT MANAGEMENT PLAN UPDATES

Any component of the project management plan may be updated as a result of this process.

5.2.4 PROJECT DOCUMENTS UPDATES

Any formally controlled project document may be changed as a result of this process. A project document that is normally updated as a result of this process is the change log. The change log is used to document changes that occur during a project.

5.3 VALIDATE SCOPE

Validate Scope is the process of formalizing acceptance of the completed project deliverables. The key benefit of this process is that it brings objectivity to the acceptance process and increases the probability of final product, service, or result acceptance by validating each deliverable. This process is performed periodically throughout the project as needed. The inputs and outputs of this process are depicted in Figure 5-4.

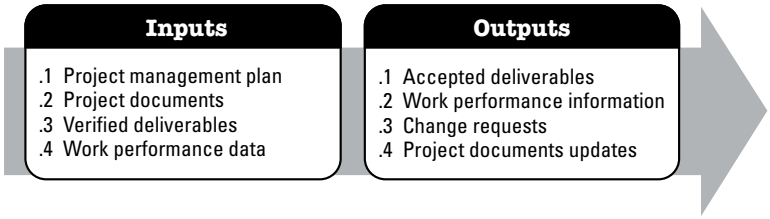


Figure 5-4. Validate Scope: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.3.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Scope management plan,
- Requirements management plan, and
- Scope baseline.

5.3.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Quality reports,
- Requirements documentation, and
- Requirements traceability matrix.

5.3.3 PROJECT DOCUMENTS UPDATES

Examples of project documents that may be updated as a result of this process include but are not limited to:

- Lessons learned register,
- Requirements documentation, and
- Requirements traceability matrix.

5.4 CONTROL SCOPE

Control Scope is the process of monitoring the status of the project and product scope and managing changes to the scope baseline. The key benefit of this process is that the scope baseline is maintained throughout the project. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 5-5.

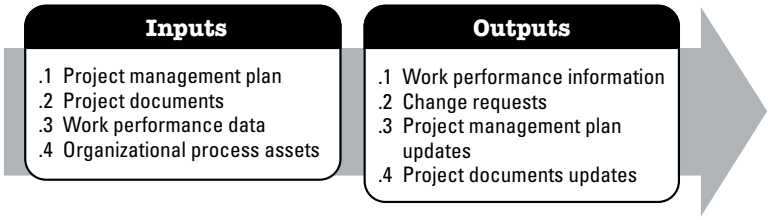


Figure 5-5. Control Scope: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.4.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Scope management plan,
- Requirements management plan,
- Change management plan,
- Configuration management plan,
- Scope baseline, and
- Performance measurement baseline.

5.4.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Requirements documentation, and
- Requirements traceability matrix.

5.4.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Scope management plan,
- Scope baseline,
- Schedule baseline,
- Cost baseline and
- Performance measurement baseline.

5.4.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Lessons learned register,
- Requirements documentation, and
- Requirements traceability matrix.

5.5 CONTROL SCHEDULE

Control Schedule is the process of monitoring the status of the project to update the project schedule and manage changes to the schedule baseline. The key benefit of this process is that the schedule baseline is maintained throughout the project. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 5-6.

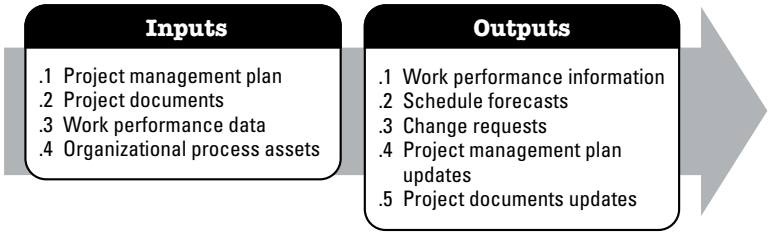


Figure 5-6. Control Schedule: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.5.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Schedule management plan,
- Schedule baseline,
- Scope baseline, and
- Performance measurement baseline.

5.5.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Project calendars,
- Project schedule,
- Resource calendars, and
- Schedule data.

5.5.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Schedule management plan,
- Schedule baseline, and
- Cost baseline and
- Performance measurement baseline.

5.5.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Basis of estimates,
- Lessons learned register,
- Project schedule,
- Resource calendars,
- Risk register, and
- Schedule data.

5.6 CONTROL COSTS

Control Costs is the process of monitoring the status of the project to update the project costs and managing changes to the cost baseline. The key benefit of this process is that the cost baseline is maintained throughout the project. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 5-7.

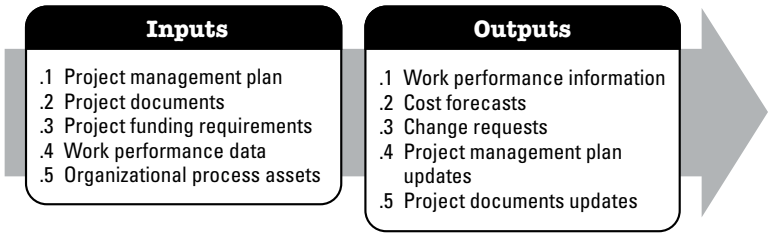


Figure 5-7. Control Costs: Inputs and Outputs

The needs of the project determine which components of the project management plan are necessary.

5.6.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Cost management plan,
- Cost baseline, and
- Performance measurement baseline.

5.6.2 PROJECT DOCUMENTS EXAMPLES

An example of a project document that may an input for this process includes but is not limited to the lessons learned register.

5.6.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Cost management plan,
- Cost baseline, and
- Performance measurement baseline.

5.6.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Basis of estimates,
- Cost estimates,
- Lessons learned register, and
- Risk register.

5.7 CONTROL QUALITY

Control Quality is the process of monitoring and recording results of executing the quality management activities to assess performance and ensure the project outputs are complete, correct, and meet customer expectations. The key benefit of this process is verifying that project deliverables and work meet the requirements specified by key stakeholders for final acceptance. This process is performed throughout the project. The inputs and outputs of this process are shown in Figure 5-8.

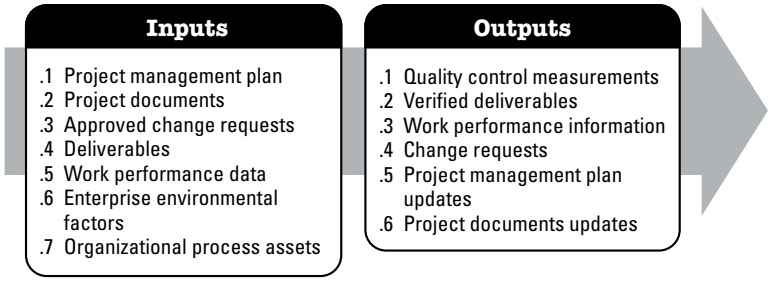


Figure 5-8. Control Quality: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.7.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the quality management plan.

5.7.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Lessons learned register,
- Quality metrics, and
- Test and evaluation documents.

5.7.3 PROJECT MANAGEMENT PLAN UPDATES

A component of the project management plan that may be updated as a result of this process includes but is not limited to the quality management plan.

5.7.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Issue log,
- Lessons learned register,
- Risk register, and
- Test and evaluation documents.

5.8 CONTROL RESOURCES

Control Resources is the process of ensuring that the physical resources assigned and allocated to the project are available as planned, as well as monitoring the planned versus actual utilization of resources and taking corrective action as necessary. The key benefit of this process is ensuring that the assigned resources are available to the project at the right time and in the right place and are released when no longer needed. This process is performed throughout the project. The inputs and outputs of this process are shown in Figure 5-9.

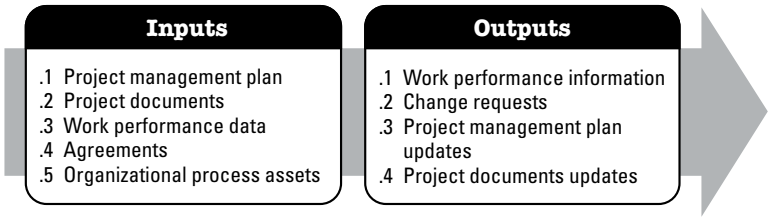


Figure 5-9. Control Resources: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.8.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the resource management plan.

5.8.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Issue log,
- Lessons learned register,
- Physical resource assignments,
- Project schedule
- Resource breakdown structure,
- Resource requirements, and
- Risk register.

5.8.3 PROJECT MANAGEMENT PLAN UPDATES

A component of the project management plan that may be updated as a result of this process includes but is not limited to:

- Resource management plan,
- Schedule baseline, and
- Cost baseline.

5.8.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Issue log,
- Lessons learned register,
- Physical resource assignments,
- Resource breakdown structure, and
- Risk register.

5.9 MONITOR COMMUNICATIONS

Monitor Communications is the process of ensuring the information needs of the project and its stakeholders are met. The key benefit of this process is the optimal information flow as defined in the communications management plan and stakeholder engagement plan. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 5-10.

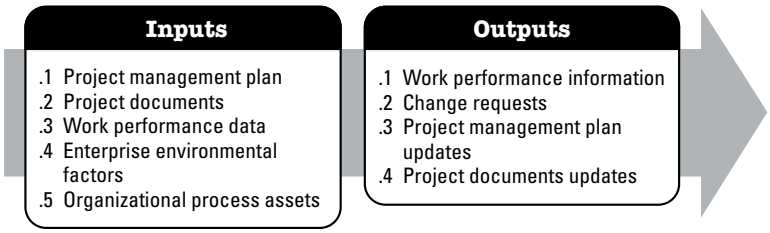


Figure 5-10. Monitor Communications: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.9.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Resource management plan,
- Communications management plan, and
- Stakeholder engagement plan.

5.9.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Issue log,
- Lessons learned register, and
- Project communications.

5.9.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Communications management plan, and
- Stakeholder engagement plan.

5.9.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Issue log,
- Lessons learned register, and
- Stakeholder register.

5.10 MONITOR RISKS

Monitor Risks is the process of monitoring the implementation of agreed-upon risk response plans, tracking identified risks, identifying and analyzing new risks, and evaluating risk process effectiveness throughout the project. The key benefit of this process is that it enables project decisions to be based on current information about overall project risk exposure and individual project risks. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 5-11.

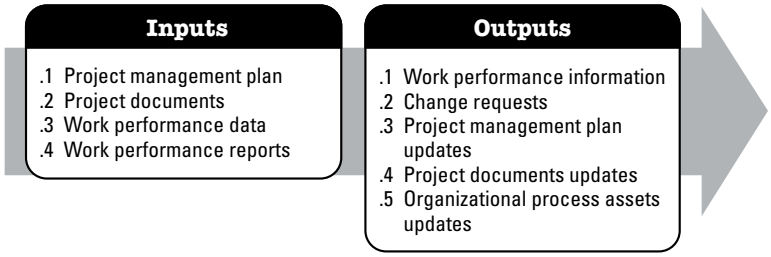


Figure 5-11. Monitor Risks: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.10.1 PROJECT MANAGEMENT PLAN COMPONENTS

An example of a project management plan component that may be an input for this process includes but is not limited to the risk management plan.

5.10.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Issue log,
- Lessons learned register,
- Risk register, and
- Risk report.

5.10.3 PROJECT MANAGEMENT PLAN UPDATES

Any component of the project management plan may be updated as a result of this process.

5.10.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Assumption log,
- Issue log,
- Lessons learned register,
- Risk register, and
- Risk report.

5.11 CONTROL PROCUREMENTS

Control Procurements is the process of managing procurement relationships, monitoring contract performance and making changes and corrections as appropriate, and closing out contracts. The key benefit of this process is that it ensures that both the seller's and buyer's performance meets the project's requirements according to the terms of the legal agreements. This process is performed throughout the project, when procurements are active. The inputs and outputs of this process are depicted in Figure 5-12.

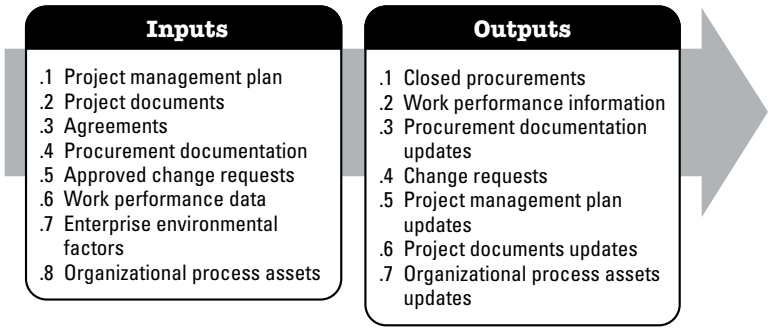


Figure 5-12. Control Procurements: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.11.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Requirements management plan,
- Risk management plan,
- Procurement management plan,
- Change management plan, and
- Schedule baseline.

5.11.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Lessons learned register,
- Milestone list,
- Quality reports,
- Requirements documentation,
- Requirements traceability matrix,
- Risk register, and
- Stakeholder register.

5.11.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Risk management plan,
- Procurement management plan,
- Schedule baseline, and
- Cost baseline.

5.11.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Lessons learned register,
- Resource requirements,
- Requirements traceability matrix,
- Risk register, and
- Stakeholder register.

5.12 MONITOR STAKEHOLDER ENGAGEMENT

Monitor Stakeholder Engagement is the process of monitoring project stakeholder relationships, and tailoring strategies for engaging stakeholders through modification of engagement strategies and plans. The key benefit of this process is that it maintains or increases the efficiency and effectiveness of stakeholder engagement activities as the project evolves and its environment changes. This process is performed throughout the project. The inputs and outputs of this process are depicted in Figure 5-13.

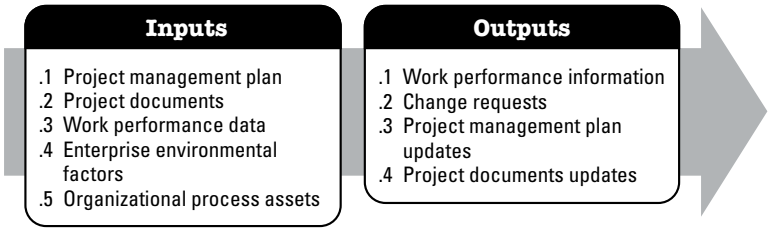


Figure 5-13. Monitor Stakeholder Engagement: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

5.12.1 PROJECT MANAGEMENT PLAN COMPONENTS

Examples of project management plan components that may be inputs for this process include but are not limited to:

- Resource management plan,
- Communications management plan, and
- Stakeholder engagement plan.

5.12.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Issue log,
- Lessons learned register,
- Project communications,
- Risk register, and
- Stakeholder register.

5.12.3 PROJECT MANAGEMENT PLAN UPDATES

Components of the project management plan that may be updated as a result of this process include but are not limited to:

- Resource management plan,
- Communications management plan, and
- Stakeholder engagement plan.

5.12.4 PROJECT DOCUMENTS UPDATES

Project documents that may be updated as a result of this process include but are not limited to:

- Issue log,
- Lessons learned register,
- Risk register, and
- Stakeholder register.

6

CLOSING PROCESS GROUP

The Closing Process Group consists of the process(es) performed to formally complete or close a project, phase, or contract. This Process Group verifies that the defined processes are completed within all of the Process Groups to close the project or phase, as appropriate, and formally establishes that the project or project phase is complete. The key benefit of this Process Group is that phases, projects, and contracts are closed out appropriately. While there is only one process in this Process Group, organizations may have their own processes associated with project, phase, or contract closure. Therefore, the term Process Group is maintained.

This Process Group may also address the early closure of the project, for example, aborted projects or cancelled projects.

The Closing Process Group (Figure 6-1) includes the project management process identified in Section 6.1.

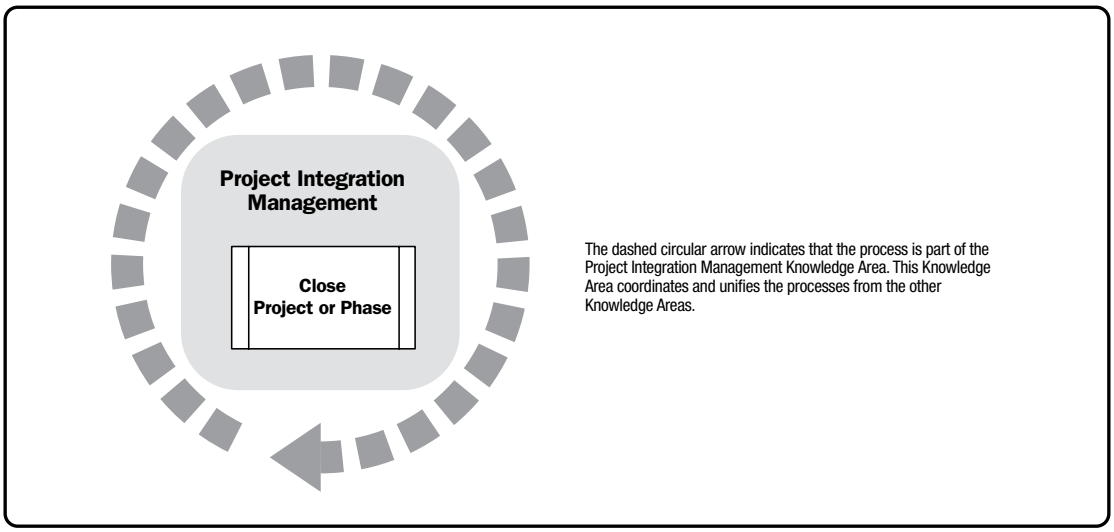


Figure 6-1. Closing Process Group

6.1 CLOSE PROJECT OR PHASE

Close Project or Phase is the process of finalizing all activities for the project, phase, or contract. The key benefits of this process are the project or phase information is archived, the planned work is completed, and organizational resources are released to pursue new endeavors. This process is performed once or at predefined points in the project. The inputs and outputs of this process are depicted in Figure 6-2.

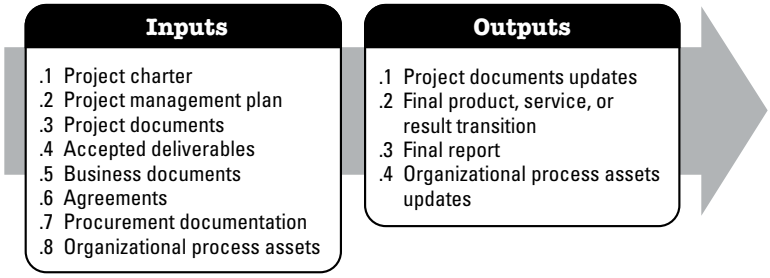


Figure 6-2. Close Project or Phase: Inputs and Outputs

The needs of the project determine which components of the project management plan and which project documents are necessary.

6.1.1 PROJECT MANAGEMENT PLAN COMPONENTS

All components of the project management plan may be inputs to this process.

6.1.2 PROJECT DOCUMENTS EXAMPLES

Examples of project documents that may be inputs for this process include but are not limited to:

- Assumption log,
- Basis of estimates,
- Change log,
- Issue log,
- Lessons learned register,
- Milestone list,
- Project communications,
- Quality control measurements,
- Quality reports,
- Requirements documentation,
- Risk register, and
- Risk report.

6.1.3 PROJECT DOCUMENTS UPDATES

Any project documents that may be updated as a result of this process include but are not limited to the lessons learned register.