Project Management Process Groups

Project Management Skills

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Preface

Organizations are increasingly using project management techniques within their operations and the specialist language of project management has become more and more commonplace in managerial and executive meetings. This trend is here to stay and it means that managers need to be familiar with project management roles, terms, and processes.

The Project Management Institute (PMI) is a not-for-profit professional organization for the project management profession with the purpose of advancing project management. It is responsible for maintaining the industry standard known as 'The Project Management Body of Knowledge' (PMBOK® Guide), which is recognized by the American National Standards Institute (ANSI). The PMI is also responsible for administering the most widely recognized and respected project management credential (PMP), which is held by over 500,000 project management professionals worldwide.

This eBook follows the first eBook in this series 'Project Management Principles.' Its aim is to help you to identify the appropriate project management process to apply at any point in your own project.

You will learn what each of the process groups consists of and the processes you need to perform within each group during your project. The process groups are:

- Initiating and its 2 processes.
- Planning and its 24 processes.
- Executing and its 8 processes.
- Monitoring & Controlling and its 11 processes.
- Closing and its 2 processes.

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Introduction

The 47 project management process described in the PMBOK® Guide can be organized in two different ways: by Process Group and by Knowledge Area.

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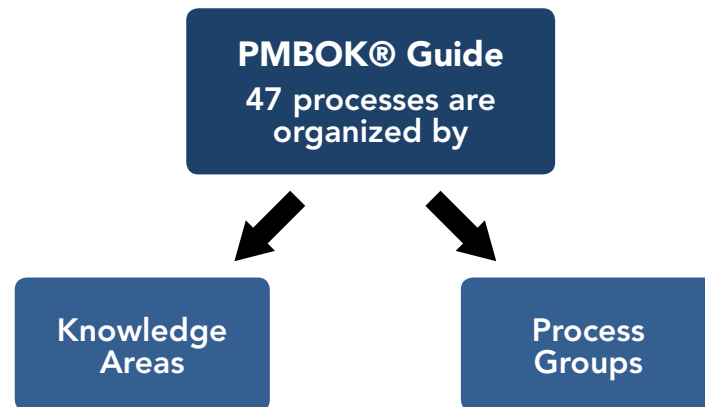
The Project Management Skills set of eBooks on our website includes a separate eBook for each of the ten knowledge areas. This eBook describes the PMBOK® from the perspective of process groups and should be read first.

The PMBOK® Guide deals with this view in Chapter 3 and defines process groups as follows:

> *'These five Process Groups (Initiating, Planning, Executing, Monitoring & Controlling, Closing) have clear dependencies and are typically performed in the same sequence on each project.*
>
> *They are independent of application areas or industry focus.*
>
> *Individual Process Groups and individual constituent processes are often iterated prior to completing the project.'*

The explanation the PMBOK® Guide gives for categorizing processes into process groups is described as follows:

> *'Process groups and their constituent processes are guides for applying appropriate project management knowledge and skills during the project.'*

The Guide makes it clear that the process groups are not meant to be prescriptive activities that are executed one after the other. You do not perform initiation, then planning etc. in sequence. You need to be continually reviewing each process group as the project environment alters as it progresses. Projects in the real world are a process of evolution where you review each aspect during its production to ensure the deliverable meets the requirements.

The reason for describing things in terms of process groups at all is that these groups offer a simplified and idealized way of looking at project management that minimizes the potential for misinterpretation, and makes the whole process easier to understand.

For example, looking at the planning process as something discrete that has defined inputs and outputs makes sense because even if it is being done at the same time as one or more of the other processes it is always done in the same way. There is no need to do different types of planning at different stages of the project because planning is planning no matter when you do it and no matter what else is happening at the same time.

To make this clear, consider the following example of a project to build a new hospital.

The project is to build a new hospital.

The Project Sponsor is the area health authority.

The project is divided into three phases:

- *Clearing the site*
- *Constructing the buildings*
- *Commissioning the medical facilities.*

These phases are not divisions of the project based on time, but are stages of the project that produce a major deliverable.

They are usually sequential, but they sometimes overlap.

For example:

- *The phase 'Constructing the buildings' could begin before the whole site was completely cleared.*

Similarly,

- *Medical equipment could be moved into parts of the building before construction was completely finished.*

When you divide a project into phases like this, it is usual to manage each phase as a project in its own right. For example, clearing the site would have its own initiation and planning process and would probably be nearing closure before the second phase 'Constructing the buildings' began its execution phase.

It is quite conceivable that issues that came to light during the clearing phase would impact on the construction phase. For example, the clearing phase might uncover issues with the land that mean that the foundations needed to be modified.

New Hospital Project Life Cycle							
1. Clear Site	Initiate	Plan	Execute	Close			
2. Construction		Initiate	Plan	Execute		Close	
3. Purchase of all Medical Supplies		Initiate	Plan	Execute		Close	
				RE-plan Coronary	Execute	Close	

Later on in the project, the commissioning phase could be subjected to scope changes and re-planning because of changes to healthcare policy, changes to health and safety regulations, new medical equipment becoming available, etc. For example, imagine the project is at the point where the building work is nearing completion and medical equipment is being transferred over from other hospitals and bought in from suppliers. The health authority then receives a government grant for several million dollars to spend on acute coronary care.

At this point, they could decide to re-scope the parts of the project that deal with the coronary care unit. This would result in major re-planning of this area of the project but without affecting other areas, which would be nearing closure.

In the real world, a project like this one would have initiation, planning, executing, monitoring and controlling, and closure processes all happening at the same time.

Anyone looking at this project that did not have a good understanding of project management processes would probably see it as disorganized and chaotic.
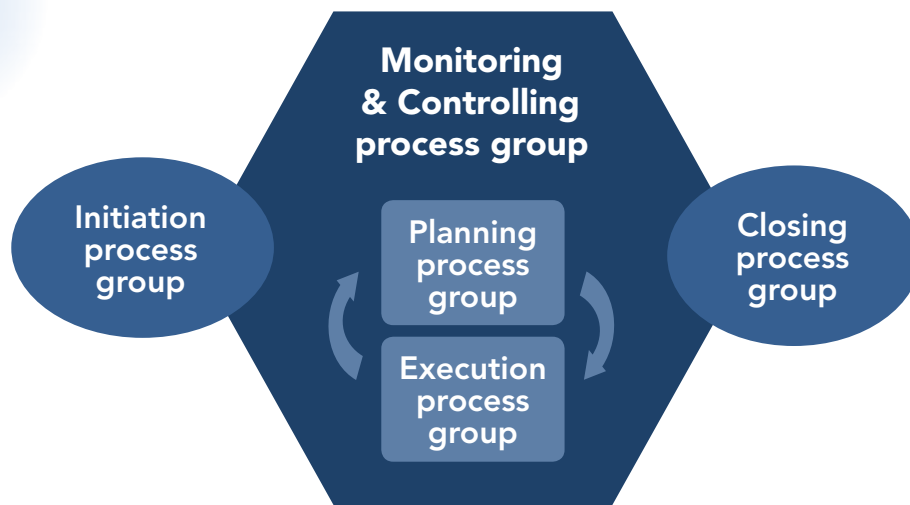
In contrast, someone who was familiar with the processes, even in a simplified and idealized form, would see that there was actually a structured management framework being used.

Before you read any further, make sure that you understand this concept. Process groups DO NOT NEED to happen in sequence throughout the life of the project, neither are they the same as project phases or stages. Process groups are executed at a high level for the whole project but they are also repeated at lower levels even down to that of individual work packages when this is necessary.
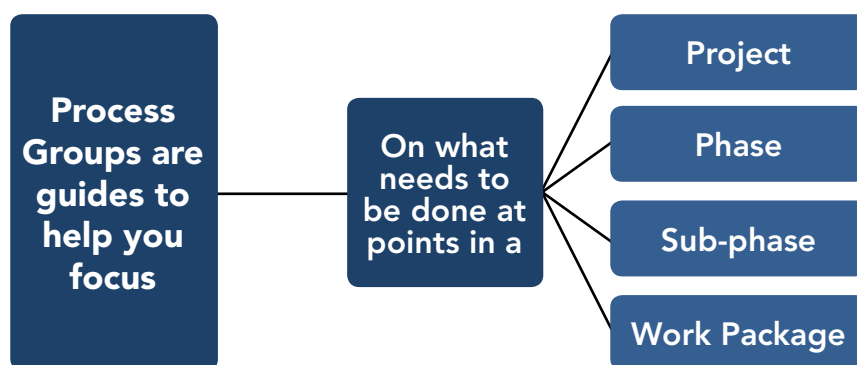
The process groups are guides that are designed to help you to focus on what needs to be done at particular points in a project, phase, sub-phase or work package. The aim of this eBook is to help you to identify the appropriate project management process to apply at any point in your own project.

Consequently, unless you are taking the PMI exams (in which case you will need to purchase the official study material) the best thing to do is to read through the remainder of this book with the intention of gaining a high-level appreciation of the whole project management process. All you need to take on board are the basic principles; don't try to memorize the details.

KEY POINTS

✔ The 47 project management processes described in the PMBOK® Guide can be organized in two different ways: by Process Group and by Knowledge Area.

✔ Process groups are not meant to be prescriptive activities that are executed one after the other.

✔ The process groups are guides that are designed to help you to focus on what needs to be done at particular points in a project, phase, sub-phase, or work package.

The Origin of the PMBOK® Process Groups
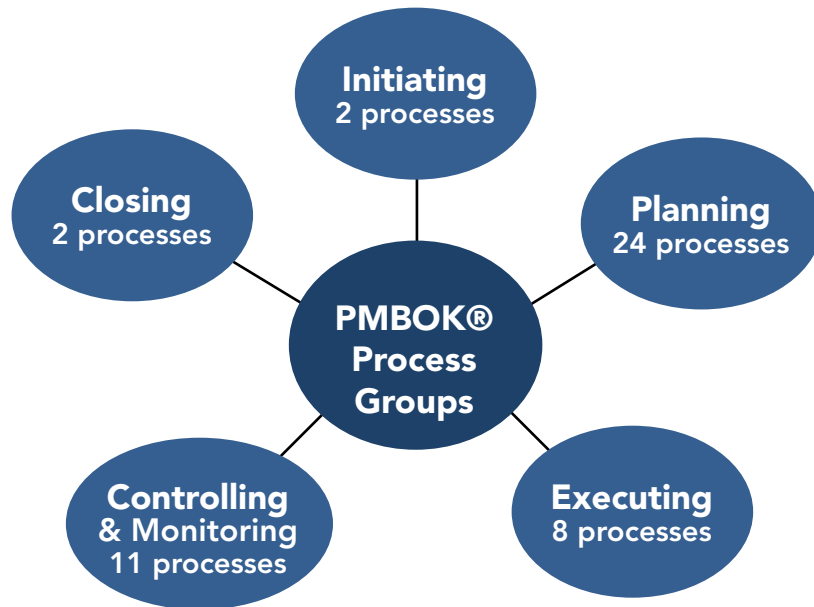
As described earlier, there are five process groups in the PMBOK® Guide:

- Initiating (2 processes)
- Planning (24 processes)
- Executing (8 processes)
- Monitoring & Controlling (11 processes)
- Closing (2 processes)

Before looking at these in detail it is worth taking time to consider some general principles that underpin them.

The PMBOK® Guide process groups are derived from a business process model developed by Walter A. Shewhart and popularized by W. Edward Deming. This iterative four-step management method is used for the control and continuous improvement of processes and products.
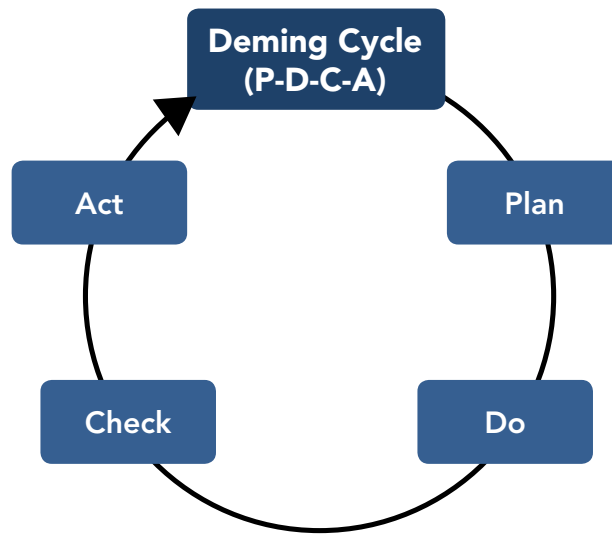
It is sometimes referred to as the Deming cycle or by the acronym P-D-C-A (Plan-Do-Check-Act). The steps in each successive PDCA cycle are:

Plan—Understand the existing situation and then establish the objectives and processes necessary to deliver results in accordance with the target or goals.

Do—Implement the plan. That is, execute the planned process.

Check—Study the actual results of the previous phase and compare them against the expected targets or goals to discover any differences.

Look for deviation from the plan in implementation and also look for the appropriateness and completeness of the plan to enable the execution.

Convert the collected data into a form that can be used in the next step.

Act—Where there are significant differences between actual and planned results request corrective actions.

Analyze the differences to determine their root causes.

Determine where to apply changes that will include improvement of the process or product.

The PMBOK® process groups can be thought of as a form of PDCA, since we are dealing with business processes in which we have to plan, do, check, and act. There are some differences in terminology:

Differences in Terminology	
Deming	PMBOK®
PDCA	PMI Process Groups
Plan	Planning
Do	Executing
Check & Act	Monitoring & Controlling
Projects are temporary so require Initiation & Closing processes	

The second major difference is due to the fact that projects are temporary; there is a need to start them and finish them, hence the Initiation and Closing process groups in the PMBOK® Guide.

As you can see, the PMBOK® process groups are nothing more than this common-sense approach modified in a way that makes them suitable for managing projects.

The final word on process groups should go to the PMBOK® Guide itself:

> *'Project management processes apply globally and across industry groups. Good practice means there is general agreement that the application of project management processes has been shown to enhance the chances of success over a wide range of projects.'*

> *'This does not mean that the knowledge, skills, and processes described should always be applied uniformly on all projects.*

> *For any given project, the project manager, in collaboration with the project team, is always responsible for determining which processes are appropriate, and the appropriate degree of rigor for each process.'*

The following sections describe what needs to occur in each of the five process groups. Please note that the section titles reflect the numbering conventions found in the PMBOK® Guide. For example, the first section is titled **3.3 Initiating Process Group**.

KEY POINTS

✔ There are five process groups in the PMBOK® Guide:

    ✔ Initiating (2 processes)

    ✔ Planning (24 processes)

    ✔ Executing (8 processes)

    ✔ Monitoring & Controlling (11 processes)

    ✔ Closing (2 processes)

✔ They can be thought of as a form of PDCA, since we are dealing with business processes in which we have to plan, do, check, and act.

✔ Because projects are temporary, there is a need to start them and finish them, hence the Initiation and Closing process groups.

3.3 Initiating Process Group

This process is defined by the PMBOK® as:

> *'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.*
>
> *Within the initiating processes, the initial scope is defined and initial financial resources are committed.*
>
> *Internal and external stakeholders who will interact and influence the overall outcome of the project are identified.'*

The answers to these questions may be more or less settled but there is some room for uncertainty. For example, you may not know exactly what the project is going to do but you should have a sufficiently clear idea so that you can document what it could do in a way that can serve as a basis for discussion.

This information is documented in the Project Charter (known as the Project Initiation Document in PRINCE2). Even the most experienced project manager and sponsor cannot be certain about things at this stage of a project and this document is understood to be provisional at this stage.

The Initiating process group answers the questions:
What is the project going to do?
What is the business case?
Who wants it to happen?
How will the project be funded?
Who will manage the work?
Who will perform the work?

When the project charter is first circulated it can attract additional sponsorship from other areas of the organization that feel as though they would benefit from getting on board and increasing the scope of the project or it can sometimes be decided that the business case is not strong enough for the project to proceed.

The main objective here is to clarify the business need and define the scope of the project and show clearly that other options have been considered and that this project is the right choice along with the reasons why this is so.

This process group is very straightforward in that it only has two processes: develop project charter and identify stakeholders.

3.3.1 Develop Project Charter—Overview

This is the process of developing a document that formally authorizes a project or a phase and documents initial requirements that satisfy the stakeholder's needs and expectations. This process is described in detail in the 'Project Integration Management' eBook available from this website.

Project Charter

↓

is a document that formally authorizes

↓

a Project or Phase.

↓

Provides initial requirements to meet

↓

Stakeholders' needs & expectations
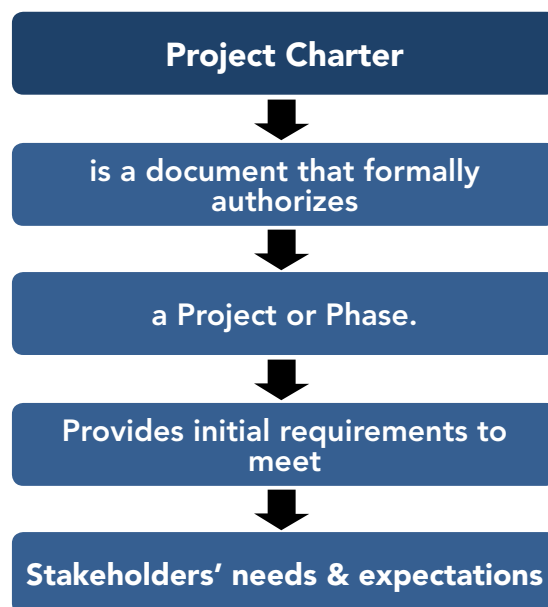
You can also find a 'Project Charter' template on this website which can help you to produce this document. You should check whether your organization has its own template that you will be expected to use.

There are a variety of inputs you will require for this process. They will be whatever you need to:

- Identify the high-level requirements
- Define and agree the high-level project scope
- Identify the project or stage objectives
- Define the project success criteria

- Identify and define any obvious milestones

- Define the approximate budget

- Ensure that the project is aligned with the organization's strategic goals

The PMBOK® refers to Organizational Process Assets and Enterprise Environmental Factors as inputs to this process and whilst this is intended to be an overview it is worth defining these here because they are used in so many different processes.

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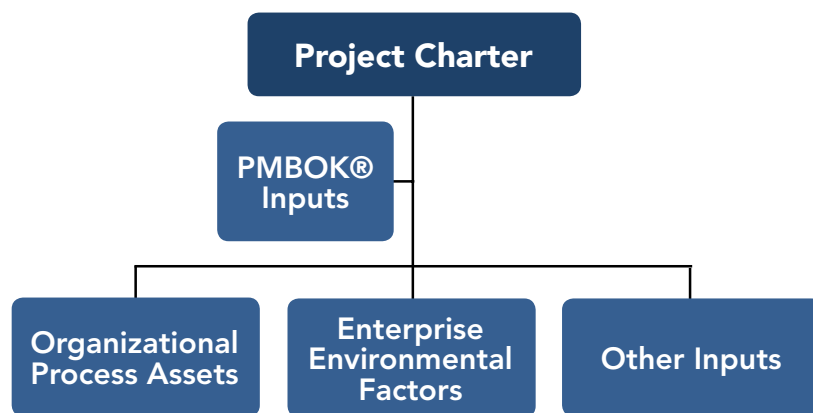
Organizational Process Assets

These are the processes or process-related assets that can be used to help this project succeed. They can be grouped into processes and procedures for conducting work, and a corporate knowledge base for storing and retrieving information. These assets would typically include:

- Documents

- Templates

- Policies

- Procedures

- Plans and guidelines

- Lessons learned, historical data and information

- Earned value

- Estimating

- Risk, etc.

Enterprise Environmental Factors

You can think of these as the way the organization 'normally does things.' For example, you should consider personnel administration policies because your company may have a limit on how many permanent staff can be assigned to a particular project or policies regarding the use of contract staff. There may also be guidelines for hiring, firing, and performance reviews.

In addition, you may already have project management information systems, software tools, available skills and expertise, standardized cost estimating data, and risk databases.

These factors need to be considered because if your organization already does things in a certain way then there is usually no point in doing them differently just because they are being done in the context of a project.

Other Possible Inputs

Depending on the nature of the project and the industry sector it will take place in there are a variety of other possible inputs to this process. They are:

- Contract Heads of Agreement
- Project Statement of Work (SoW)
- Business Case

If the project is being done on the basis of a contract then obviously this will be a major input. If the contract has not been formalized there will usually still be a 'heads of agreement'—that is, a non-binding document outlining the main issues relevant to the potential agreement.

The PMBOK® also refers to a Project Statement of Work, which is a narrative description of products or services to be delivered by the project.

For external projects, the statement of work can be received from the customer as part of a bid document—for example, request for proposal, request for information, request for bid—or as part of a contract.

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

You may have this information or you may not.

The business case is the document that is produced to illustrate the cost-benefit and required investment the organization would need to undertake for the project to go ahead. The motivation for producing a business case usually comes from one of the following:

- Legal requirement
- Market- or customer-driven demand
- Organizational need
- Technological change

3.3.2 Identify Stakeholders—Overview

Identify Stakeholders is the process of identifying all people or organizations impacted by the project, and documenting relevant information regarding their interests, involvement, and impact on project success.

Types of Stakeholders
Internal to Project
External to Project but *Internal to Organization*
External to Organization
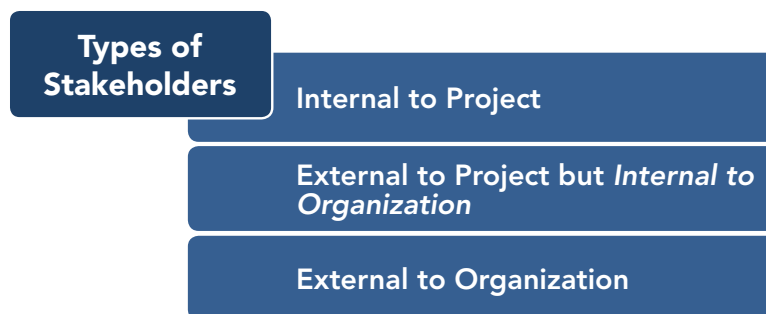
The PMI definition of a stakeholder is:

> *'Stakeholders are persons or organizations who are actively involved in the project, or whose interests may be positively or negatively affected by the performance or completion of the project.'*

The PMBOK® Guide recognizes three types of stakeholders:

- *Internal to the project.*
- *External to the project, but internal to the performing of the organization.*
- *External to both the project and the performing of organization.*

This process is described in detail in the 'Project Communications Management' eBook.

The PMBOK® initiating process group may be carried out more than once during a project, particularly if the project is split into phases or stages as each may require its own separate initiation process.

The advantage of this approach is that as each phase or stage is completed, the action of carrying out the initiating process group will help ensure that the project maintains its business focus and reasons, while ensuring that it remains viable.

As such, the agreements from each use of the PMBOK® process group are used to obtain authorization to start either the project in the first place, or the phase or stage.

When Does a Project Actually Start?

The initiation process is supposed to start the project but it appears to be part of the very process it's attempting to start. This is only a semantic problem. It could be argued that the project starts at the moment it is imagined, when the business case is approved, or at some other point; it really doesn't matter.

In reality, what often happens is that people who are working in their own department identify a possible solution to a business need and then go on to do some work to make it happen. At some point enough people will become involved that the thing starts to be seen as a project. How this process happens or at what point the word 'project' is first used varies case by case.

Initiation Process is concerned with

Clarifying the:
• Project objectives
• What is needed to achieve the objectives
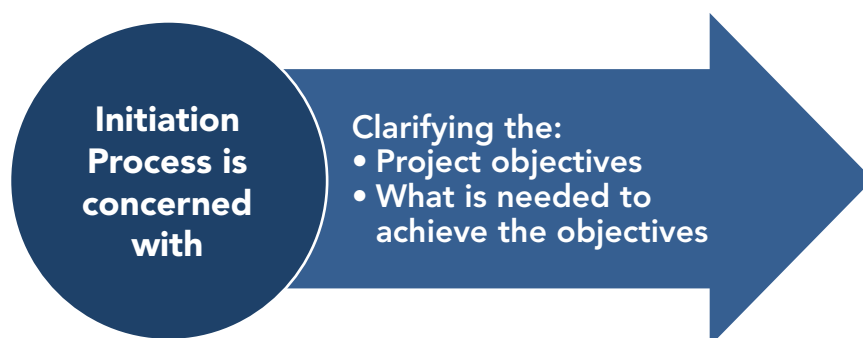
The most important thing to remember about the initiation process is that it does NOT involve starting work on creating any of the 'products' of the project. It is concerned exclusively with clarifying the project's objectives and what will be needed to achieve them.

KEY POINTS

✔ The initiating process group:

  ✔ Consists of processes necessary to define a new project or a new phase of an existing project

  ✔ Involves obtaining authorization for the project or project phase

  ✔ Defines objectives, outcomes, and success criteria

  ✔ Assigns a Project Manager (usually)

  ✔ Allocates funds and resources

✔ There are several key outputs that are produced as part of the initiation process group. These are the:

  ✔ Project Charter

  ✔ Feasibility Study and

  ✔ Stakeholder-related documents (stakeholder list, stakeholder management plan)

3.4 Planning Process Group

The planning process group provides guidelines for bringing together all of the different types of planning needed to run the project. Planning processes are found in every one of the ten knowledge areas defined by the PMBOK®.

Planning Process Group

Establishes:

Scope of Effort

Defines & Refines Objectives

Develops course of action to attain Objectives
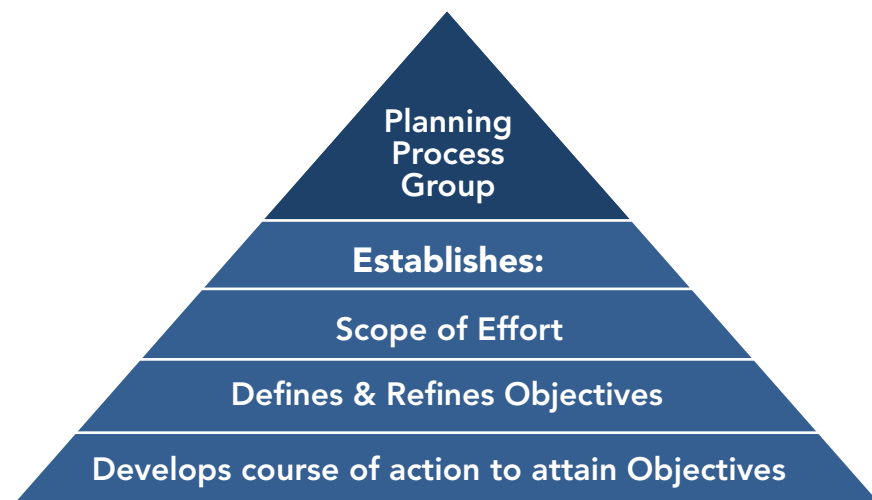
The PMBOK® defines these processes as follows:

'The planning process group consists of those processes performed to estab-lish the total scope of the effort, define and refine the objectives, and develop the course of action required to attain those objectives.'

The iterative nature of planning is essential because projects follow an uncharted path where new information is continually becoming available as the project progresses. Part of the skill of project management is knowing how much time and effort to put into each stage of the planning exercise.

The problems created by too little planning are obvious: there will be insufficient infor-mation to make valid estimates of time and cost, and the project team may become disil-lusioned with the apparent lack of direction. On the other hand, if too much planning is done then this can slow the project down (often referred to as 'paralysis by analysis') and the project team may find that the plans are simply unrealistic because they are based on unfounded assumptions.

People new to project management are often uncomfortable with the evolutionary ap-proach to the planning process, which involves defining areas in more detail as and when the necessary information becomes available. However, this is the only way to proceed if there is any degree of complexity involved.

This process is known as 'Rolling Wave Planning' and allows you to plan the project in a series of 'waves,' adding details as the project progresses. This means that you will have greater definition and details on those work packages required in the near future, and be able to elaborate on future ones as facts and details become more clearly known.

| Rolling Wave Planning | means that | work package gain more detail | the closer they are to being current activities |

This is referred to as 'progressive elaboration,' where work package requirements be-come more refined and detailed over time, and is particularly useful in projects of high uncertainty—for example, in software development or R&D projects, where the project goal is known, but the final deliverable may change somewhat as the project progresses.

Attempting to create detailed task-oriented plans for project teams in these types of environment is likely to lead to plans that are abandoned soon after being published, and a great deal of time spent endlessly re-planning rather than actually managing the project.

Unfortunately many IT projects undertake the bulk of their planning too early in the life cycle, when little concrete data is known about the problem domain, business environment, or how the team will work together. Rolling wave planning is rarely used in the construction industry, where lack of detail in initial plans may cause huge expense later.

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      │  calls on Planning &      │     │
      │  Domain experts to:       │     │
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  │ Create best  │  │ Highlight    │  │  Factor in   │
  │ estimates at │  │ areas        │  │ contingencies│
  │ the early    │  │ of uncertainty│ │              │
  │ stages       │  │              │  │              │
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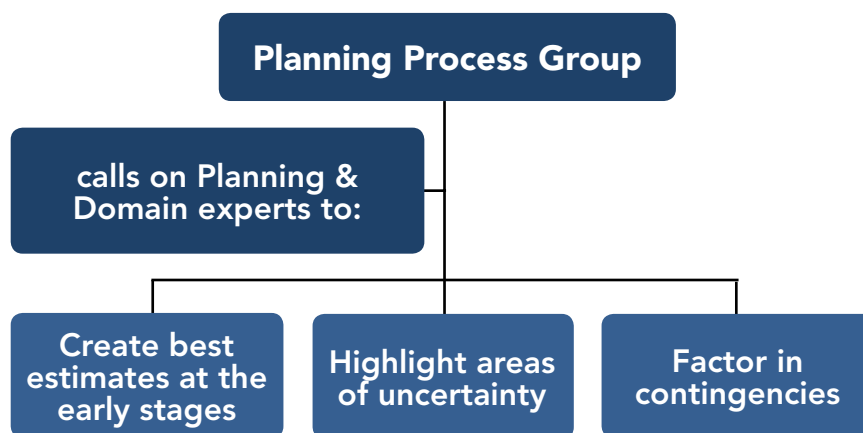
Even though a complete set of plansHotwordStyle=BookDefault; cannot usually be developed ahead of the formal start of the project, high-level plans do need to be produced to define the overall size, cost, and duration. These are necessary in order to seek the formal approval required for their initiation. This raises the question, 'How can projects be quantified and approved ahead of a detailed understanding of the resource and cost implications?'

This question has no simple answer. However, the planning process should call upon both planning and domain experts in defining the overall size and cost of the project. It should be recognized that best estimates often have to be used in the early stages of planning, but that areas of uncertainty should not be 'glossed over.' In fact, these areas should be highlighted, so that contingencies can be factored in and the planning of these areas can be refined at a later date.

Some of the decisions that will need to be made include:

- How detailed to make the plan
- How far ahead to plan
- How to involve stakeholders in planning
- How to keep the planning process streamlined
- How to manage the data that is being fed back into the planning process
- How to determine the quality and reliability of this information
- How often to re-plan
- How to administer changes to the plan
- How to minimize the effect of changes on work in progress

3.4.1 The Project Management Plan

The project management plan is the major output from this process. Developing it is the process of documenting the actions necessary to define, prepare, integrate, and coordinate all subsidiary plans. It represents the primary source of information for how the project will be planned, executed, monitored and controlled, and closed.

Is developed in the process of documenting all actions needed to:

Primary source of data for how project is:

Project Management Plan
major output of Planning Process Group

- Define
- Prepare
- Integrate
- Coordinate all subsidiary plans

- Planned
- Executed
- Monitored & Controlled
- Closed

The project management plan and other documents developed from the planning process group cover all aspects of the project scope, time, costs, quality, communications, risk, and procurements. Updates from approved changes during the project may significantly impact parts of this document and will provide greater precision with respect to schedule costs and resource requirements.

A working version will need to be released to the project team at some point so that they know what they are supposed to be doing. This plan should pass the following tests.

- Does it include all known major project tasks?
- Is it in sufficient detail to generate work packages?
- Are all activities in their chronological sequence?
- Are the task interdependencies clear?
- Is it easy to understand?
- Does it make clear to everyone involved what they are expected to do?
- Can everyone see what is being done in the next few weeks?
- Does it have broad acceptance amongst the stakeholders?
- Is it flexible and able to take account of changes?
- Are the milestones shown?
- Are the duration estimates achievable?
- Are urgent and high-priority tasks clearly highlighted?
- Can it be used to check day-to-day progress?
- Does it take account of the available resources?

The project charter along with the organizational process assets and enterprise environmental factors are three of the four inputs to the project management plan. The fourth is the actual outputs of the planning process itself.

Project Management Plan PMBOK® Inputs	Project Charter	Organizational Process Assets	Enterprise Environmental Factors	Outputs from Planning Processes

These outputs are specified by PMBOK® as the key elements in the Planning Process Group:

3.4.2 Collect Requirements—This process is essential for clarifying and managing expectations as adjustments are made throughout the project. Your project requirements document and management plan, plus the requirements traceability matrix are outputs of this process.

3.4.3 Define Scope—This process produces a detailed description of the project and its product that ensures the confidence and trust of the stakeholders. Your project scope statement and project document updates are the outputs of this process.

3.4.4 Create Work Breakdown Structure (WBS)—This is the process where you break down the project elements into manageable work packages producing your WBS and associated dictionary. The WBS Dictionary describes each component of the WBS with milestones, deliverables, activities, scope, and sometimes dates, resources, costs, quality. If the WBS element names are ambiguous, a WBS dictionary can help clarify the distinctions between WBS elements. Other outputs includes the scope baseline that enables stakeholders and the project manager to assess ongoing progress and the impact of necessary adjustments.

Outputs from Planning Processes	Quality	Human Resources
Requirements	Costs & Budget	Communications
Scope	Schedule	Risk
Work Breakdown Structure	Activities	Procurements

3.4.5 Define Activities, 3.4.6 Sequence Activities, 3.4.7 Estimate Activity Resources, 3.4.8 Estimate Activity Durations—These four processes create the list of activities and their attributes that are required for the project. These activities are then scheduled into network diagrams along with estimates of the resources needed and how long it will take to complete. These outputs enable benchmark goals to be set so that teams with the right resources can be created.

3.4.9 Develop Schedule—This process produces the schedule baseline and data needed to complete the work. This is a complex process and often requires a great deal of coordination with many project constituents.

3.4.10 Estimate Costs—This part of the planning process produces the cost estimates for each activity and phase. The expertise of your project manager will have a significant impact on their accuracy and attention to detail.

3.4.11 Determine Budget—This brings together all activity and work package cost estimates into a complete project budget. This forms the documentation for the project funding that includes contingency for potential issues that may arise and produces the cost performance baseline. To ensure smooth authorization by stakeholders these details must be presented logically and clearly.

3.4.12 Plan Quality—The quality management plan this process produces must define the quality metrics and checklists that take into account potential risks, cost performance baseline, and organizational and environmental factors.

3.4.13 Develop Human Resource Plan—Each phase of the project plan must have the correct resources and skills in the staff assigned to it. These individuals will form teams to produce work packages or for phases. The resulting management plan details the skills, roles, responsibilities, and reporting relationships that support the schedule of work and project objectives.

3.4.14 Plan Communications—Communicating the correct level of information in a timely manner to all parties is essential for your success. This management plan enables you to set and manage stakeholder expectations through your regular updates on progress and project changes. It also helps to create good working relationships within the project team, gaining their support and cooperation.

3.4.15 Plan Risk Management, 3.4.16 Identify Risks, 3.4.17 Perform Qualitative Risk analysis 3.4.18 Perform Quantitative Risk Analysis, 3.4.19 Plan Risk Responses—The importance of assessing and planning for potential risks is paramount if your project is to be completed on time and to budget. Your resulting risk register enables your communication with stakeholders to be informed and practical.

3.4.20 Plan Procurements—This management plan will define the approach your project adopts towards procurement and identify potential suppliers you want to approach. There will be detailed reports outlining procurement statements of work and decision-making throughout the project life cycle.

Developing the skills and the knowledge necessary to be aware of overall project goals, while at the same time effectively tending to the small, day-to-day details of a complex project, is what makes an excellent project manager.

While much of a top project manager's skill set will come about through years of experience, ongoing education and strong professional networking can leverage increased opportunity and success as well.

KEY POINTS

- ✔ The planning process group involves:
    - ✔ Defining the scope of the project
    - ✔ Designing the course/s of action required to achieve the project's objectives
    - ✔ Defining the products to be produced and work required
    - ✔ Sequencing work and creating a schedule
    - ✔ Estimating the resource and effort requirements
    - ✔ Estimating costs and creating a budget
- ✔ The key outputs of the planning process group are the:
    - ✔ Project Management Plan
    - ✔ Work Breakdown Structure (WBS)
    - ✔ Schedule
    - ✔ Budget
    - ✔ Other subordinate plans

3.5 Executing Process Group

The third of the process groups in the PMBOK® Guide is the executing process which the Guide defines as:

> *'It consists of those processes performed to complete the work defined in the project management plan to satisfy the project specifications. This process group involves coordinating people and resources, as well as integrating and performing the activities of the project in accordance with the project management plan.'*

The overall goal of the Executing Process Group is to set the teams in place to get the work done efficiently and effectively so that the project stays on target with regard to scope and previously agreed goals. This process is where most of the work is carried out, and where products and deliverables are built, assembled, constructed, and created. It is also here that procurement and team development takes place.

Executing Process Group

Efficient & productive teams developed

Majority of work conducted

Keep project on target

Products and deliverables built and created

Procurement of resources

This process group involves more than simply the production of project deliverables. It is intimately entwined with the monitoring and controlling process group. As the work detailed in the project plan is tackled, it becomes necessary to accept and document changes to it. This means that the main outputs of this process group include change requests and their implementation.

The eight processes that make up this process group are:

3.5.1 Direct and Manage Project Execution—This process is concerned with performing and delivering the work as defined in the project management plan so that its objectives can be attained. Project managers will spend the majority of the project budget during the execution process so scheduling and phasing details must be as accurate as possible. This includes the complete management of the change request procedure.

3.5.2 Perform Quality Assurance—A key aspect of any project is ensuring that the quality of products and deliverables meets the criteria set. Performing regular quality assurance checks has several purposes:

○ Ensures any necessary amends can be incorporated in plan to maintain quality.

○ Assures stakeholders that the project is staying within its budget. and timescales.

○ Any quality issues highlighted can be incorporated into your organization's processes as required.

3.5.3 Acquire Project Team—This process is simply concerned with ensuring the composition of people and skills matches the project's needs. It also ensures the availability of the required individuals by clearly communicating project expectations and timelines.

3.5.4 Develop Project Team—This process enables the project manager to ensure that the interactions and competencies within the team match the required level of performance. It is also the process responsible for building a cohesive team and conducting regular team assessments.

3.5.5 Manage Project Team—This process involves managing and monitoring team members' performance. The project manager will give constructive feedback to individuals or groups to ensure that issues and conflicts are avoided. It

also manages project changes to maintain performance. This process provides a means for concerns to be fed back to the project management team.

3.5.6 Distribute Information—A major contributor to a project's success is how well pertinent information is routinely communicated to the relevant parties. Selecting the best means of communicating plays a key role in this process. Knowing what issues warrant a call to a stakeholder (e.g. delay of a timeline) and those that don't helps to create a positive working environment.

3.5.7 Manage Stakeholder Expectations—Since your stakeholders are a significant party in any project, communicating appropriately with them is an essential skill to acquire. Such communications need to assure them that their needs are being met, their concerns are heard, and that issues that occur are being properly addressed.

3.5.8 Conduct Procurements—All projects need to acquire certain resources from external suppliers and having the necessary procurement processes in place ensures the correct distribution of resources. Regular reports set suppliers' expectations and provide a structured process to voice and address their responses. This process is also responsible for the timely awarding of and managing of any contracts required for the project.

While many professionals new to larger and more complex projects may feel overwhelmed by the many details and recurring processes, over time an understanding of general process patterns emerges. Through professional mentoring and additional career development in best-practice project management processes, project managers who desire the opportunity to experience much larger projects can grow into those roles. With increasing knowledge and skills come additional professional opportunities.

KEY POINTS

✔ The executing process group involves:

  ✔ Establishing and managing the project team

  ✔ Coordinating people and resources

  ✔ Monitoring team performance

  ✔ Contracting procurements

  ✔ Directing and managing project execution

  ✔ Distributing information

  ✔ Performing quality assurance activities

✔ The main outputs of this process group are:

  ✔ The risk and issue management responses plus corrective and preventative actions

  ✔ The deliverables themselves plus work performance information

  ✔ Change requests with regards to utilization and effectiveness of the quality plan

  ✔ Negotiation and influence to ensure appropriate staff are assigned

  ✔ Motivation building and mentoring to ensure the team performance

  ✔ Conflict resolution and problem solving

  ✔ Procurements and contracts are negotiated and put in place

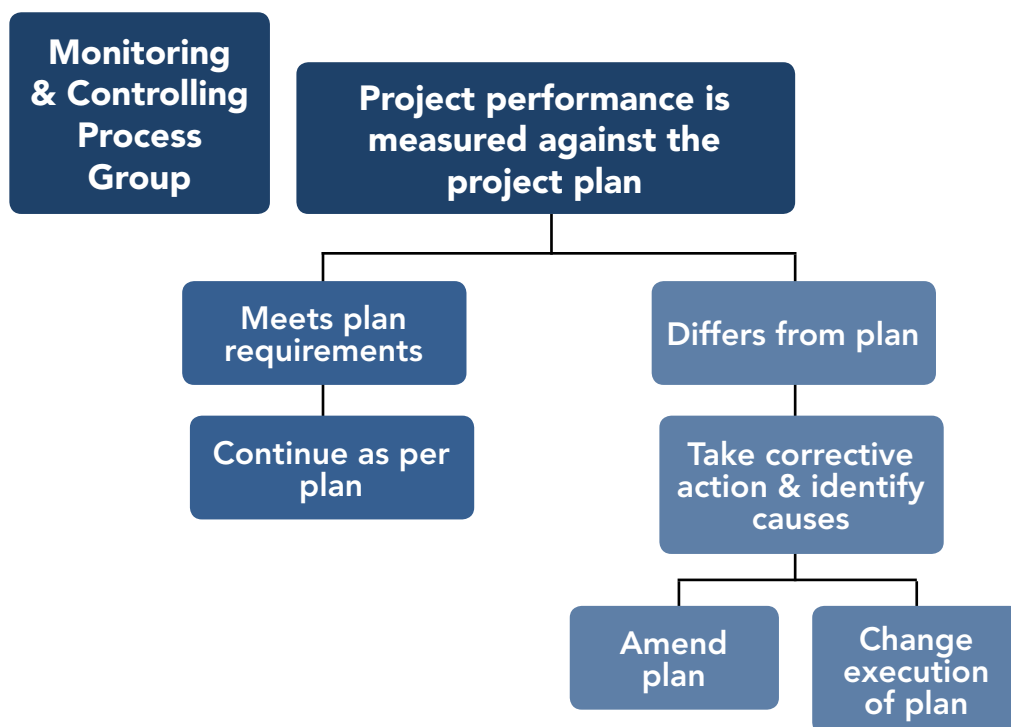 ✔ Organizational process assets are updated as a result of executing the project management plan

3.6 Monitoring and Controlling Process Group

The fourth process group of PMBOK® can be described as:

'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    │ ──▶ │  Collecting │ ──▶ │  Change  │
│  & Controlling  │     │ Performance │     │  Control │
│  Process Group  │     │    Data     │     │          │
└─────────────────┘     └─────────────┘     └──────────┘
```

This process group involves every knowledge area except for human resources and is where the performance of the project is measured and action is taken based on an analysis of this data. The results of the executing processes are compared against the plan and where differences exist, corrective action is taken either to change the plan itself or the way in which the plan is being executed.

```
┌──────────────┐   ┌──────────────────────┐
│  Monitoring  │   │ Project performance  │
│ & Controlling│   │  is measured against │
│   Process    │   │    the project plan  │
│    Group     │   │                      │
└──────────────┘   └──────────────────────┘
                     │                  │
          ┌──────────────────┐   ┌──────────────┐
          │   Meets plan     │   │ Differs from │
          │  requirements    │   │     plan     │
          └──────────────────┘   └──────────────┘
          ┌──────────────────┐   ┌──────────────┐
          │ Continue as per  │   │ Take corrective│
          │      plan        │   │ action & identify│
          └──────────────────┘   │    causes      │
                                 └──────────────┘
                                  │            │
                         ┌─────────────┐ ┌─────────────┐
                         │   Amend     │ │   Change    │
                         │    plan     │ │  execution  │
                         │             │ │   of plan   │
                         └─────────────┘ └─────────────┘
```

The point of the exercise is to take account of what is being learned from the execution of the plan and to re-plan on the basis of this new information, in order to prevent future project work from becoming too detached from the plan.

Evaluation and comparison of actual measured results against those planned is the fundamental principle of this process group. Where there is a variance corrective action is required to keep the project on schedule and to budget. The inputs are the project plan and progress reports that contain data collected from the project team. Where progress deviates significantly, and this usually means outside of a predetermined tolerance limit, it is important to identify the underlying causes and take corrective action.

Reporting mechanisms are time-sensitive and you will need to be able to take appropriate action as and when deviations occur. If the reporting mechanisms are slow then you will not be able to control the project; you will just have an historical account of how out of control it was.
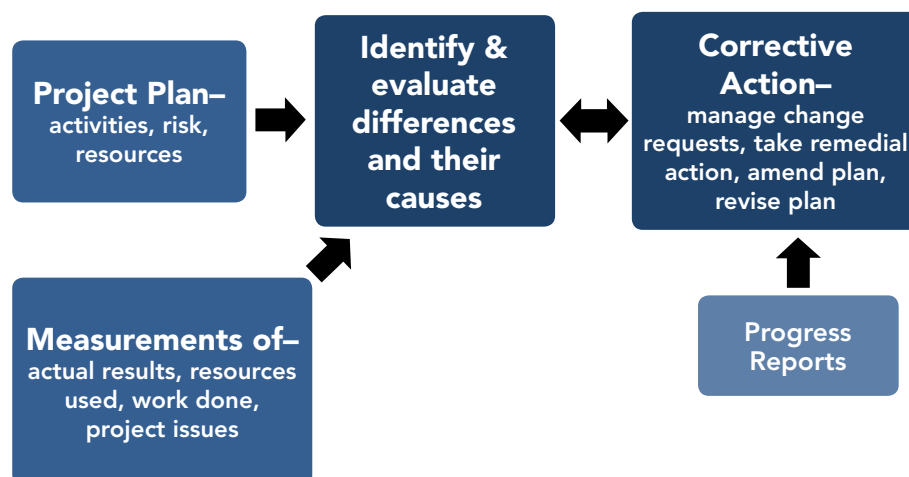

The control framework will vary from project to project, reflecting the size and complexity of the project and the extent to which the different levels of management are involved in it. Short projects subject to a high degree of change and uncertainty will require shorter reporting cycles than projects of a longer duration that are relatively stable.

Collecting Performance Data

The best control systems are often the simplest and making the data collection processes complex only increases both the costs and possibility of error. The accuracy and

timeliness of the data collection procedures will also be influenced by a series of practical issues and the overall attitude of project management staff.

Project Team's approach to reports must be:	
	Honest
	Objective
	Accurate
	Up-to-date
	Timely
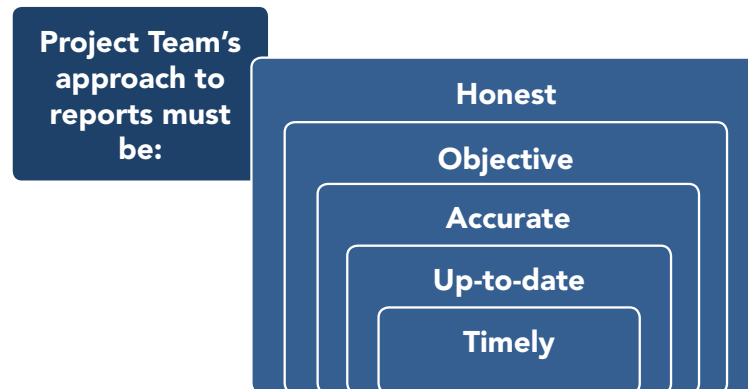
A practical issue that needs to be addressed is how the executing activities will be monitored and how progress will be reported. Project team members are usually expected to maintain up-to-date timesheets and records of the activities they are involved with. Their team leader then collates the data and passes it to the project manager.

The quality of this performance data is absolutely critical to the success of the project. Many projects run into trouble because reported progress does not match what is actually happening and the project manager acting on this information is unaware that problems are quietly stacking up. Project team members tend to develop a positive or negative attitude towards the value and importance of data collection quite early on in the project depending on how it is acted on by management.

Ideally the data that is collected should be as objective as possible and measure deliverables that have been completed or signed-off in some way. The worst approach is to ask people how much progress they have made on a task in percentage terms. Many people are naturally optimistic and want to be seen as a productive team member, which leads to persistent over-reporting of the progress they have made. This problem is made worse when management respond in a negative way to reported overruns.

You do not want team members attempting to disguise how much (or how little) progress they have made because if they do then the whole monitoring and control process will be a waste of time. You must do everything possible to collect objective data in a non-judgmental way.

Change Control

As well as monitoring activities against the plan this process group also includes controlling changes and recommending preventive action in anticipation of potential problems.
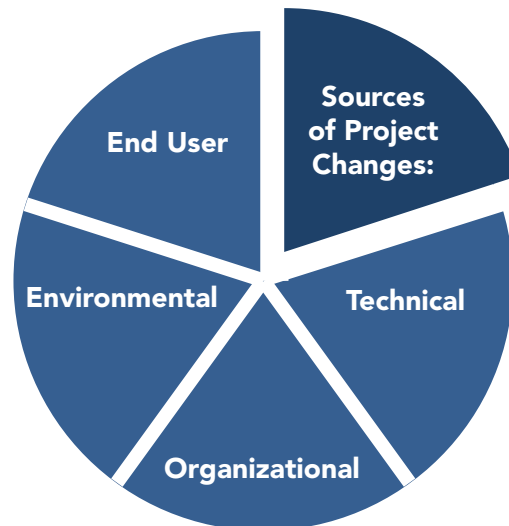
No matter how carefully planned a project has been, changes will need to be made as it progresses. These will result from both external influences as well as problems that arise within the project environment. The four main sources of change are:

Environmental: resulting from changes in legislation, government policy, or business strategy.

Organizational: High-level business decisions may change the basic terms of reference of the project—for example, there may be a change to the overall scope of the project.

End-User: resulting from changes in customer requirements. It is also possible that feedback gained during the review or testing of a product may show that it is unsuitable in some unexpected way.

Technical: New technology may offer a better solution to that originally planned. Alternatively, technical problems may prevent a product from working in the way that it was supposed to.

All of these potential changes need a process to control them and their effect on the project. This process, called change control, should ensure that proposed changes are interpreted in terms of their potential effect on project timescales, costs, benefits, quality, and personnel.
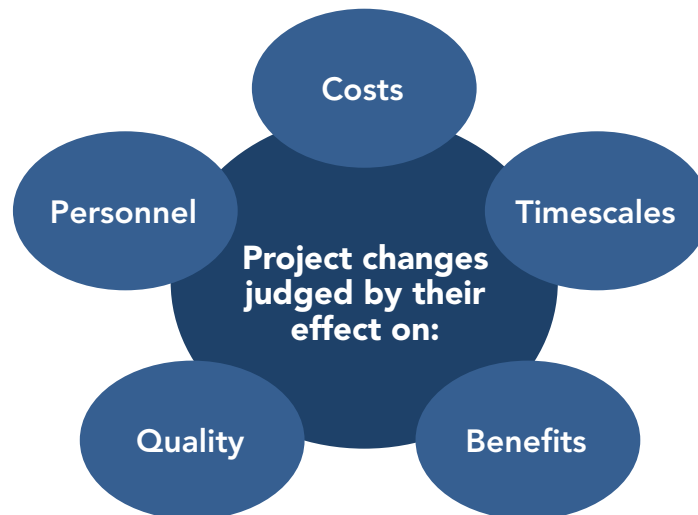
Where there is a proposed alteration to the project's products, change control should analyze the change and assess its impact, prioritize and plan the necessary work, and finally control its implementation.

Any person associated with a project should be able to raise any concern they have at any time. The concern may involve a perceived problem or a suggestion for an improvement to some area of the work, documentation, or project organization. These issues should be reviewed at regular meetings.

| Change Request Outcomes | Accepted | Rejected | Specification changed to match deliverables |

There are three possible outcomes when an issue is considered:

1. A change to the design or features of a product may be agreed. This will mean changing the way the product is specified in the plans and updating any costs and timescales accordingly. An impact analysis should also be performed.

    This process looks at the knock-on effects of the change on other deliverables, and also the effect if the changes are not implemented. The purpose of the impact analysis is to arrive at a balanced view of the effect of the proposed change on the project's ability to satisfy its mandate. This will enable project management to decide whether to proceed with the change or not.

2. The proposed change is rejected because it is not felt to represent a significant concern.

3. The third option is unusual but it does occasionally happen that a deliverable does not agree with its specification and changing the specification is a better solution than changing the deliverable.

Where changing the deliverable is thought to be the best option, the project manager should use the impact analysis to assess the change in terms of its effect on timescales, cost, benefit, quality, personnel, and risk and to decide at what level the decision to proceed should be taken. He or she should then determine whether or not the proposed change is significant enough to be referred back to the sponsor.

The necessary tasks and their relevant PMBOK® number for this process group are:

3.6.1 Monitor and Control Project Work—This process is concerned with tracking the progress of the performance objectives as they have been defined in the project management plan. Another aspect of this process is the reviewing, regulating, and forecasting of these objectives.

The performance reports generated by this process feed into other processes to monitor and control cost, resources, risk, scope, schedule, quality, benchmark goals, and timelines. The project status report is a key method of keeping your project stakeholders informed about project progress and performance. These documents provide a trail and history that can be used to aid future projects.

3.6.2 Perform Integrated Change Control—Changes are inevitable in any project and it is this process that manages the reviewing, approving, documenting and then execution of the proposed changes. The larger the project the greater the number of change requests. These changes are most likely to alter the project deliverables and plan. It is essential the project manager documents and assesses each change against its impact on timescales and budget.

3.6.3 Verify Scope—This process formally accepts project deliverables as being complete. To attain this completed status all documentation relating to that phase or work package must be included to be accepted as complete. This includes documenting any follow-through that is required as the project progresses.

3.6.4 Control Scope—Any changes to the scope baseline must be closely monitored and, once accepted, reflected in the project scope and relevant work packages. These adjustments must be communicated to the project stakeholders so that implications for the budget and timeframes can be understood and agreed to.

3.6.5 Control Schedule—The project schedule baseline is a critical document and it is essential that any changes or adjustments that result from monitoring are properly incorporated and communicated to all necessary parties. Careful and thorough monitoring will reduce instances of major setbacks due to scheduling issues that have been poorly reported.
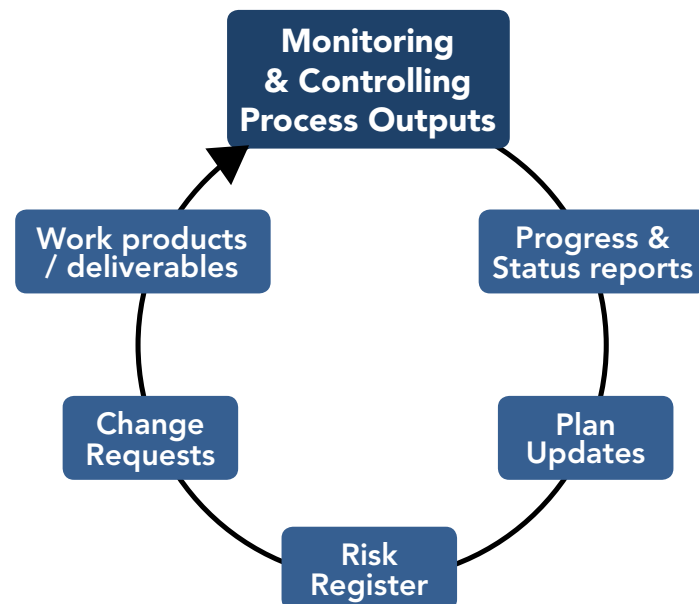
3.6.6 Control Costs—Monitoring and controlling the costs of any project are critical aspects of its success. It is essential that project status reports accurately report current expenditure and forecasted spend, and highlight any variances from the cost baseline.

3.6.7 Perform Quality Control—Managing and controlling the quality of what is produced during a project are vital to its success. This process monitors the quality of the executed activities, assesses how well it matches the required quality metrics and checklist, and recommends any necessary changes.

3.6.8 Report Performance—This is the process that defines and monitors the production of performance status reports, measurements, and forecasts. These reports form a key aspect of the communication within the project team and stakeholders on how well progress maps the project benchmark goals.

3.6.9 Monitor and Control Risks—This process plays a key role in project management and performance because it documents identified risks, and monitors and evaluates any changes or responses to this initial assessment. It is also identifies, evaluates, and reports new risks, updating the risk register as appropriate.

3.6.10 Administer Procurements—All projects require the procurement of some resources so that their performance matches project timelines and budget. This process manages, monitors, and documents the performance of suppliers against the contracted requirements. It also manages these working relationships to ensure that any changes that occur during the contract period are properly incorporated and delivered.

KEY POINTS

✔ The Monitoring & Controlling Process Group

  ✔ Involves tracking, reviewing, and regulating project progress

  ✔ Includes status reporting, progress measurement, and forecasting

  ✔ Reports on scope, schedule, cost, resources, quality, and risks

  ✔ Controls project and project document changes

- ✔ Includes control of scope, schedule, costs, and risks
- ✔ Formalizes acceptance of deliverables (called scope verification in PMBOK®)
- ✔ Records quality control results
- ✔ Implements risk treatment plans and actions
- ✔ Administers procurements
- ✔ The key outputs are:
  - ✔ Progress and status reports
  - ✔ Plan updates
  - ✔ Risks registers
  - ✔ Change requests
  - ✔ Work products/deliverables
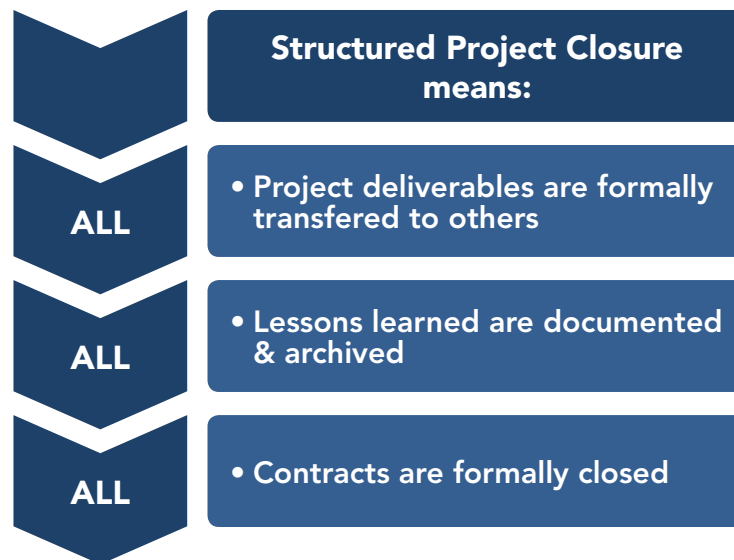
3.7 The Closing Process Group

This is the final process group of the PMBOK® Guide and is defined as:

'Those processes performed to terminate formally all activities of a project or project phase, and the transfer of the completed product to others or to close a cancelled project.'

A carefully structured project closure phase should ensure that the project is brought to a controlled end, which in practice means that:

- All of the project deliverables are formally transferred to others.
- All of the lessons learned from the project are documented and archived.
- Any contracts established by the project are formally closed.

Structured Project Closure means:

ALL
• Project deliverables are formally transfered to others

ALL
• Lessons learned are documented & archived

ALL
• Contracts are formally closed

The PMBOK® divides the closing process into two main areas:

3.7.1 Close Project or Phase

This is the process of finalizing all activities across all of the Project Management Process Groups to formally complete the project or phase. When closing the project, the project manager will review all prior information from the previous phase closures to ensure that all project work is complete and that the project has met its objectives.

Since project scope is measured against the project management plan, the project manager will review that document to ensure completion before considering the project closed. This process also establishes the procedures to investigate and document the reasons for actions taken if a project is terminated before completion.

3.7.2 Close Procurements

This is the process of formally closing any contracts set up by the project and involves verification that all work and deliverables were acceptable. It also involves administrative activities such as finalizing open claims, updating records to reflect final results, and archiving such information for future use.

The Project Closure Meeting

A formal closure meeting can help to ensure that none of the important lessons learned during the project are lost and that everything that could help future projects is properly documented. The project manager should organize this meeting and define which individuals from the project need to attend.

It is neither practical nor necessary for everyone to attend in person, but the project manager needs to request input from everyone involved so that everything is captured and properly documented. The mechanism open to anyone to contribute to this meeting in writing could follow similar lines to that of project performance reports.

KEY POINTS

- ✔ The key activities for the closing process group are:
    - ✔ Obtaining acceptance by the customer or sponsor (approval to close)
    - ✔ Releasing people and resources
    - ✔ Reporting on team performance and lessons learned
    - ✔ Updating or finalizing documents, project records, and results
    - ✔ Finalizing procurements
    - ✔ Performing quality assurance activities
    - ✔ Storing or archiving information
- ✔ The key outputs of this group are:
    - ✔ Certificate of Completion/Closeout Report
    - ✔ Staff work assignments
    - ✔ Resource calendars
    - ✔ Plan updates
    - ✔ Final work products/deliverables or services

Summary

Successful projects use a methodology to ensure that the project is managed properly and the objectives are achieved. One of the most popular frameworks used by organizations is the PMBOK® Guide. This eBook has provided an overview of the five project management process groups that form the basis of this framework.
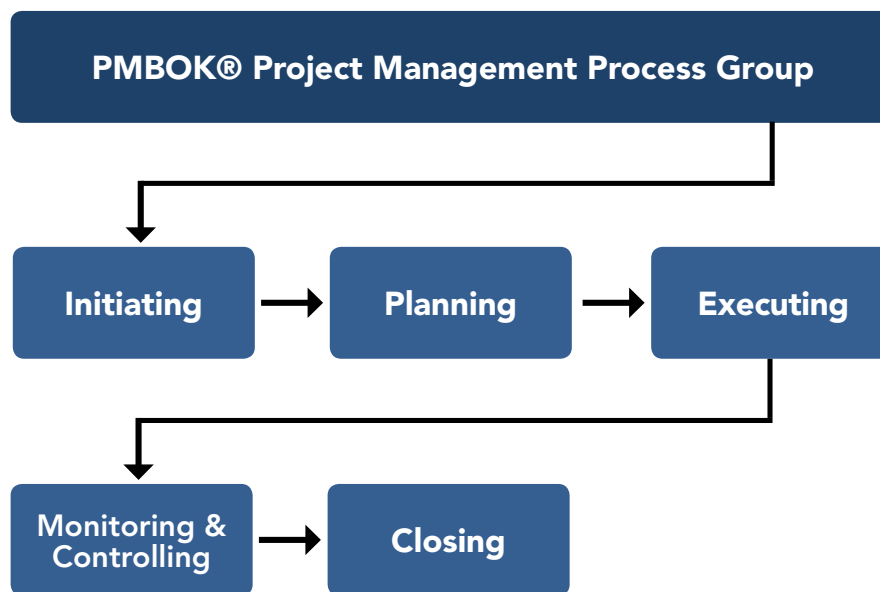
They are:

- Initiating (2 processes)
- Planning (24 processes)
- Executing (8 processes)
- Monitoring & Controlling (11 processes)
- Closing (2 processes)

The basic principles behind the Planning, Executing, and the Monitoring & Controlling processes are encapsulated in the Deming cycle. This iterative four-step management method is used for the control and continuous improvement of processes and products.
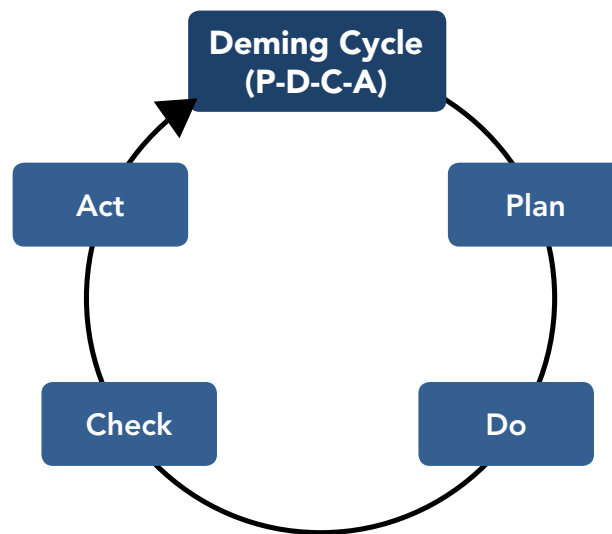
It involves four activities Plan-Do-Check-Act. Because projects are temporary, there is a need to start them and finish them, hence the Initiation and Closing process groups in the PMBOK® Guide.

Where a project is split into stages, the processes of these groups repeat in every stage of the project. This means that each stage must be initiated, planned, executed, and closed, as well as monitoring and controlling being present throughout each stage. Once a stage is completed, the processes are repeated for the next stage.

The five Process Groups are defined in PMBOK® along with their reference numbers as shown below:

3.2.1 Initiating Process Group

Defines and authorizes the project or a project phase.

Outputs: Project Charter, and preliminary Project Scope Statement.

3.2.2 Planning Process Group

Defines and refines objectives, and plans the course of action required to attain the objectives and scope that the project was undertaken to address.

3.2.3 Executing Process Group

Integrates people and other resources to carry out the project management plan for the project.

3.2.4 Monitoring and Controlling Process Group

Measures and monitors progress to identify variances from the project management plan so that corrective action can be taken when necessary to meet project objectives.

3.2.5 Closing Process Group

Formalizes acceptance of the product, service, or result and brings the project or phase to an orderly end.

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