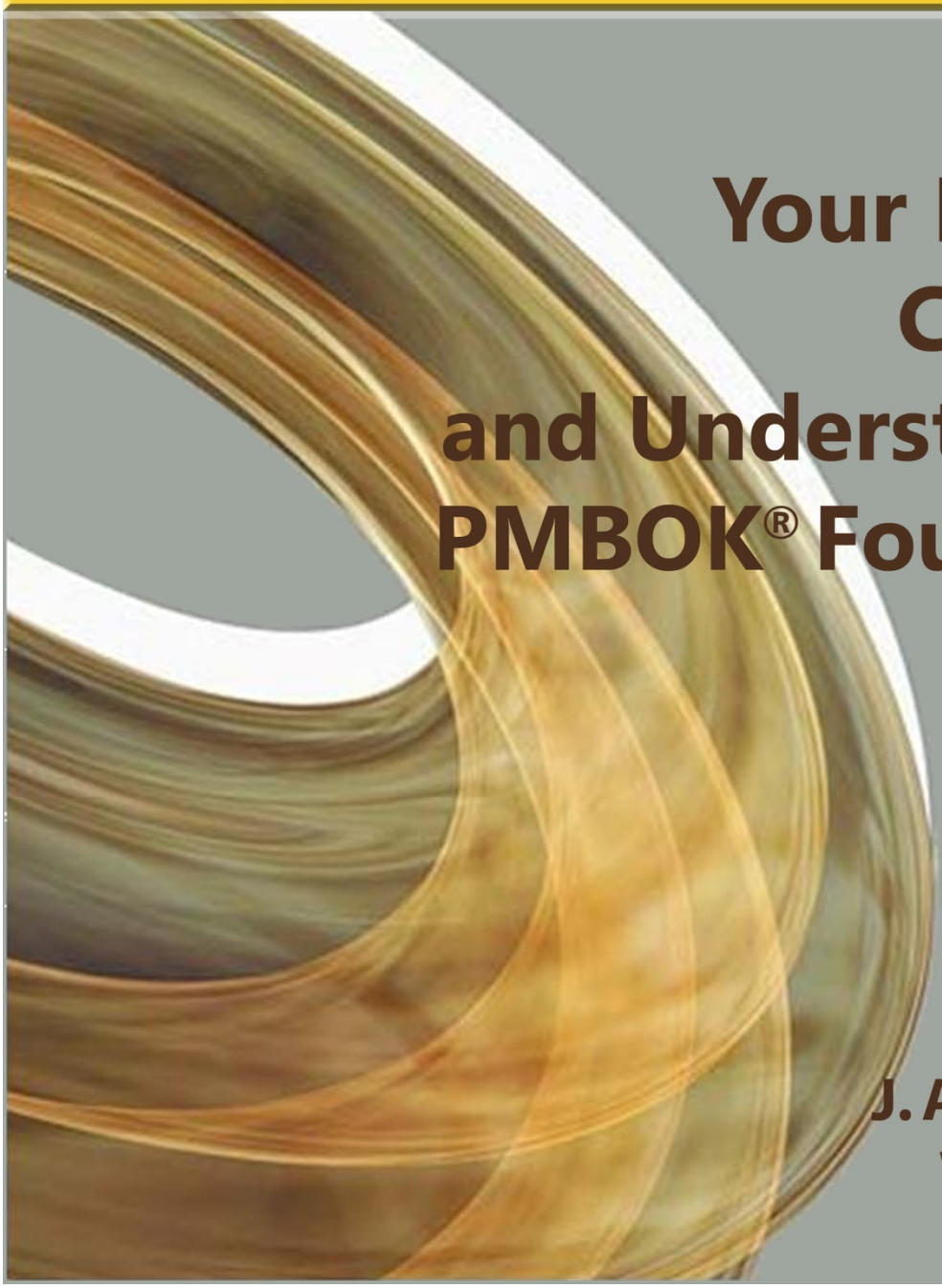
Project Management Road Trip®

For the Project Management Professional®



Your Key to PMP Certification and Understanding the PMBOK® Fourth Edition

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www.PMRoadTrip.com

Project Management Road Trip for the Project Management Professional:
Your Key to PMP Certification and Understanding the PMBOK Fourth Edition

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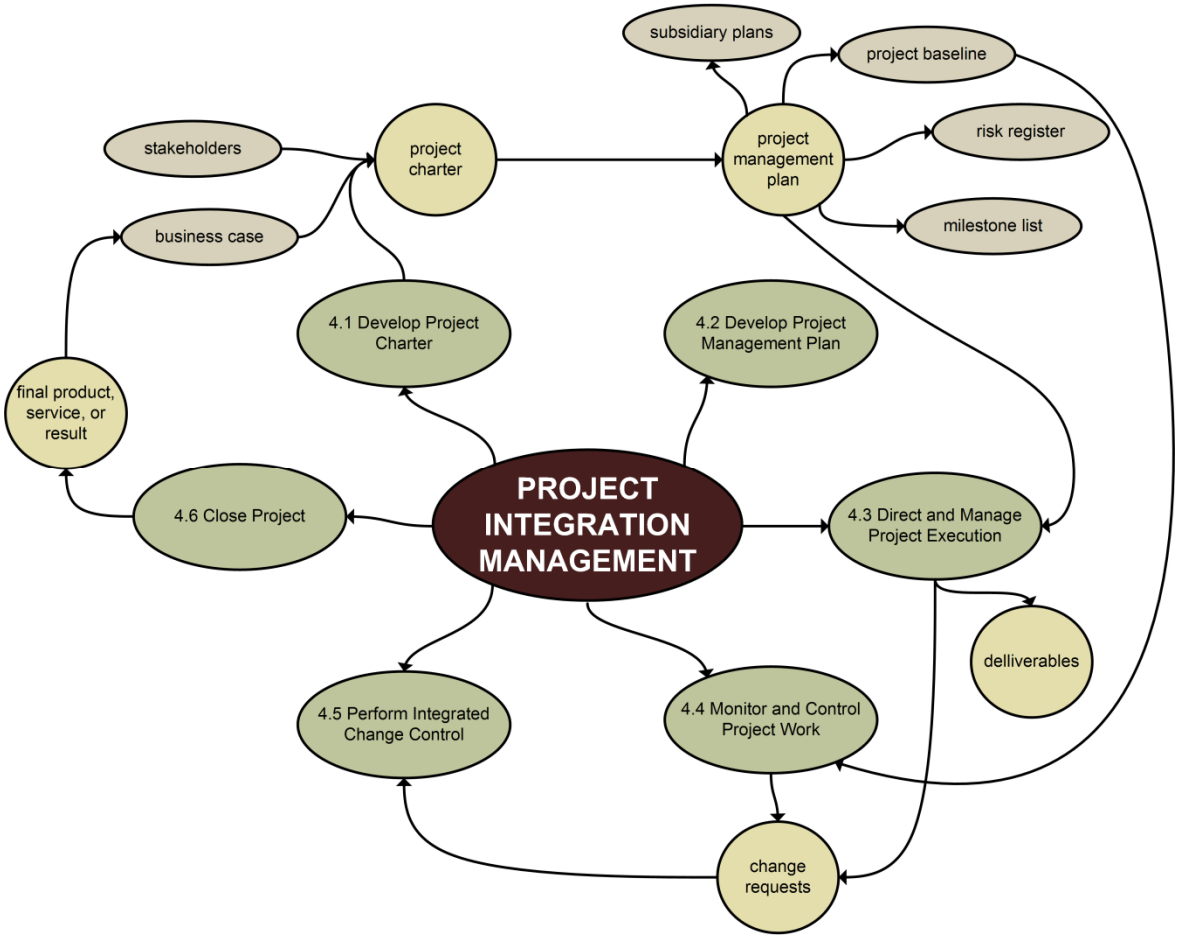
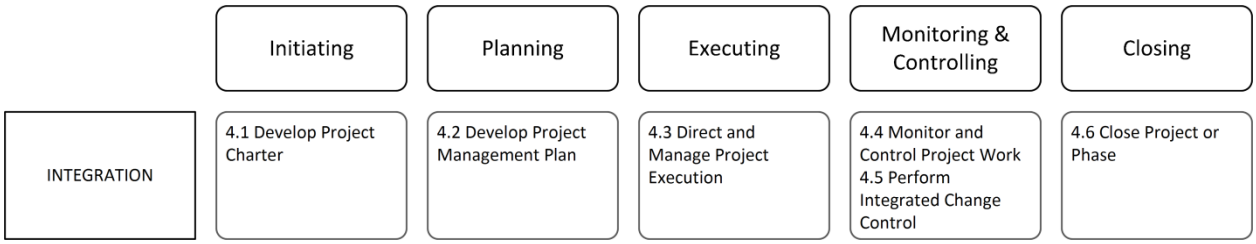
TABLE OF CONTENTS

4.0 Project integration management

Chapter Difficulty: Easy | **Moderate** | Hard

The Project Integration Management knowledge area is the one that unifies all the project management processes and takes a holistic view of the overall project. Processes in this knowledge area serve to coordinate all project management activities.



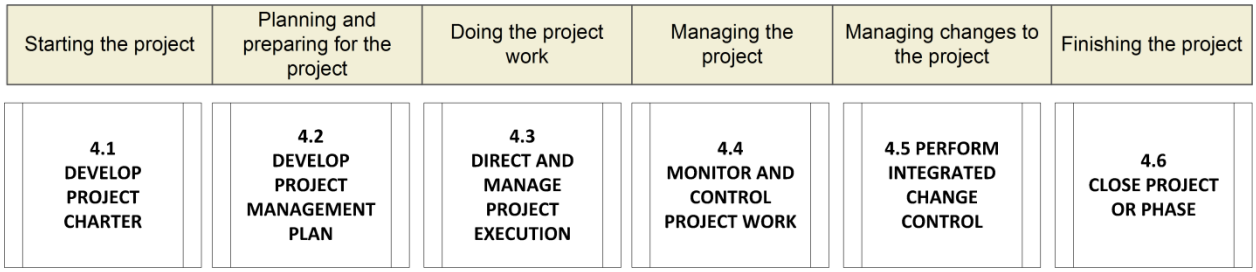


Keywords

- ☐ Business case
- ☐ Change control board
- ☐ Change management plan
- ☐ Change request
- ☐ Communications management plan
- ☐ Configuration management plan
- ☐ Configuration management system
- ☐ Contract
- ☐ Corrective action
- ☐ Cost management plan
- ☐ Forecasts
- ☐ Human resource plan
- ☐ Integrated change control
- ☐ Milestone list
- ☐ Performance measurement baseline
- ☐ Preventative action
- ☐ Process improvement plan
- ☐ Procurement management plan
- ☐ Project charter
- ☐ Project management plan
- ☐ Project sponsor
- ☐ Quality management plan
- ☐ Resource calendar
- ☐ Risk management plan
- ☐ Risk register
- ☐ Schedule management plan
- ☐ Scope management plan
- ☐ Statement of work

Overview

While other knowledge areas will focus on specific subject matters, such as scope, cost, or quality, the processes in integration management cover all areas of the project management life cycle. The purpose of integration management is to make sure that project activities are unified and well coordinated.



There are six project integration processes that encompass the entire project life cycle.

- **Develop Project Charter**: Establishing the project, its project manager, boundaries, and business objectives.
- **Develop Project Management Plan**: Defining the project's goals, deliverables, work, and performance objectives.
- **Direct and Manage Project Execution**: Directing the project activities as defined by the project management plan.
- **Monitor and Control Project Work**: Reviewing the project's actual work as compared to what was planned.
- **Perform Integrated Change Control**: Coordinating changes so that they're properly integrated into the project plan and project documents.
- **Close Project or Phase**: Final acceptance of the deliverables by the customer, formally closing the project, and archiving knowledge assets for the organization and future projects.

The major activities that will occur during integration management processes are:

- Framing the project's business objectives
- Establishing a plan to meet the business' objectives
- Managing and addressing stakeholder expectations
- Finding alternative approaches to meet needs
- Negotiating conflicts
- Determining the appropriate level of rigor that needs applied to individual project management processes
- Making sure the project remains focused on its objectives
- Making sure the project operates within the established scope, time, cost, quality, and risk constraints
- Taking actions to correct or prevent problems
- Managing issues and changes as they occur
- Verifying the deliverables have met the customer's needs
- Hand-off of the final deliverables to the customer
- Archiving project records in historical libraries.

While the project is underway, it will be faced with options that can be solved only by making tradeoffs between scope, time, cost, quality, and risk. Project integration management best epitomizes one

important facet of our role as project managers, and that is serving as the one with the best overall picture of the project. That means we're the ones best capable to make sure that decisions, plans, changes, and actions performed aren't short-sighted but are instead done with a deliberate purpose that is best for the overall project.

4.1 Develop project charter

	Initiating	Planning	Executing	Monitoring & Controlling	Closing
INTEGRATION	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Execution	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase

The **project charter** formally authorizes the project and establishes a partnership between the performing organization and the project's stakeholders and yet-to-be-named project team.

The charter can be as detailed as is warranted by the project, but it's usually done only at a high level.

The project charter should contain the following:

- A high-level, broad description of the project.
- The business case, which describes the organizational need and justification for the project's existence, including ROI or other cost/benefit data.
- A statement of work describing the desired product or services, including the business need and linkage to the organization's strategic plan.
- The project manager assigned to the project and other initial roles (sponsor).
- The major stakeholders and their influences and project interest.
- The expectations of the initiator, sponsor, and stakeholders.
- The requirements of the customer.
- What is necessary to meet everyone's expectations.
- The measurable success criteria for the project and who'll sign off and measure those success points when the project is completed.
- A summary budget.
- What are the major milestones and a summary schedule.
- Any assumptions that have been made or constraints that have been established.

The charter is issued either by the project initiator or project sponsor, and that person's executive status should be commensurate with the project --projects with large objectives, budgets, or other big impacts on the organization should be chartered by a senior executive while projects with lesser impacts might be chartered by departmental management. In most cases it is unrealistic to expect a senior executive to produce the project charter as defined in the PMBOK. If the sponsor or initiator is not able to provide the charter then the project manager should work with the sponsor or initiator to develop the document.

The charter serves several key purposes. From the business perspective it links the need for the project to the organization's strategic plan. Without this linkage a project is likely to suffer from a lack of priority, urgency, and resources. The charter should also include the initiator's or sponsor's vision that describes how the final product, service, or result will impact the organization. A vision statement differs from the business case in that it addresses what the organization will be like when the project succeeds, so the vision can be a powerful marketing tool, providing the project's purpose in language that keeps the customer, stakeholders, and project team focused on a single motivating goal.

From the project management perspective the charter names the project manager and provides the legitimate power base authorizing him or her to apply the resources agreed upon to achieve the objectives. A project without a charter is a project not worth the effort because it's a dangerous endeavor for both the organization and project team –without formal authority a project manager isn't likely to have the power needed to negotiate with the customer, stakeholders, and other managers within the organization for scarce resources.

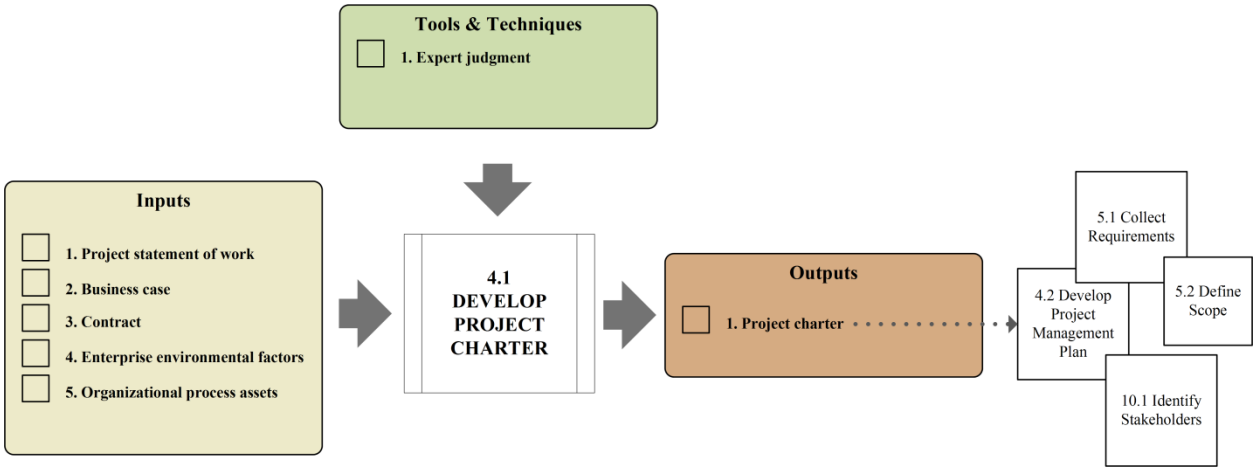
The charter provides the framework for all subsequent planning processes, so it's beneficial to have the project manager be named and begin participating in project planning and decisions as early as possible. It's important for us to remember that the project charter provides information only as it is currently known. The deliverables, stakeholders, constraints, budget, milestones, and risks are laid out in the charter as best they can be during initiation.

Just as with most processes, the project charter is very likely to undergo many iterations while the project is clarified. In some cases the project's scope and objectives may change to such a degree that the project may need to be re-chartered. Even after the charter is formally issued, the Develop Project Charter process can be revisited during phase transitions. Doing so can validate that the project and charter are still properly in line with the project objectives, and it can also be used to authorize work to begin on subsequent phases.

When the project charter is completed, it undergoes some form of approval by a person with sufficient authority to commit the organization's resources, such as the project initiator, sponsor, portfolio manager, PMO executive, or other company executive.

> When I talk about vision I'm simply saying that you need a single encapsulating idea which defines the aim of your project. Why are you doing the project in the first place? If you can't state the aim of your project in a single sentence, then it's not a project.[1]
>
> Nick Jenkins, A Project Management Primer

4.1 Process decomposition



Inputs

☐ **Project statement of work**
A statement of work is a written description of the project's deliverable. Statements of work can range from informal to very formal, especially when parties outside of the performing organization are involved. It's usually supplied by the external or internal customer, but the project manager should work with the customer, initiator or sponsor to create a statement of work when it doesn't exist.

☐ **Business case**
The business case provides the strategic and financial justification for the project. It includes a narrative and benefit/cost information. The exact content of the business case will usually depend upon the organization's policies, the type of project, and the effort and cost of the project.

☐ **Contract**
If the project is being undertaken for an organization other than the performing organization then a contract is likely to be involved. When a contract exists it's an input to the Develop Project Charter because it'll contain information about product requirements, cost, milestones, and procurement requirements.

☐ **Enterprise environmental factors**
Any of the many enterprise environmental factors and systems that influence the project should be considered, especially any standards or regulations that may apply and marketplace conditions.

☐ **Organizational process assets**
Organizational process assets certainly influence project success, and they are the source of existing policies, templates, processes, organizational data and knowledge, and they should be drawn upon. These can provide inputs to project management process requirements, help identify stakeholders who may not otherwise be known at this stage, and identify constraints and assumptions.

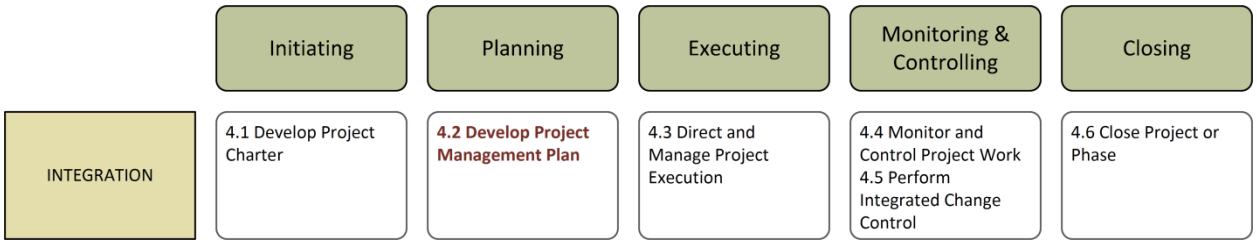
Tools and Techniques

- ☐ **Expert judgment**
  Expert judgment is based upon the experience and knowledge of subject matter experts. It's used to assess and evaluate the inputs and the information they contain.

Outputs

- ☐ **Project charter**
  The project charter formally authorizes the project and the project manager. It also provides the business case, objectives, and success criteria of the project. The charter provides the framework for project planning activities.

4.2 Develop project management plan



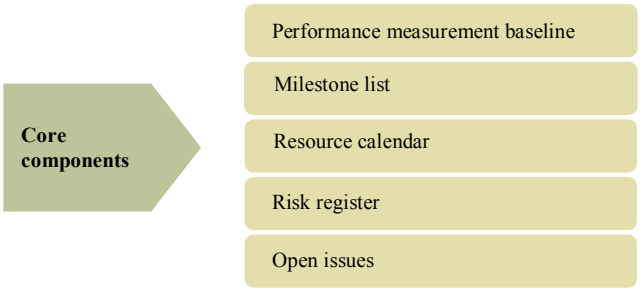
The project management plan defines how the project is to be executed, monitored and controlled, and closed[2], and it's established by the **Develop Project Management Plan** process and refined throughout the entire duration of the project.

The project plan isn't a Gantt chart and it isn't just a project schedule. It's a comprehensive, consolidated document that contains everything anyone needs to know about the project and how the project will be managed.

First, there are some characteristics about the project management plan we'll need to remember:

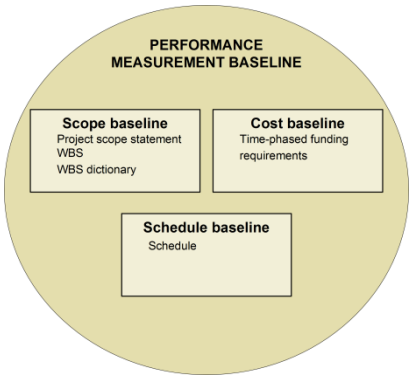
- **The project management plan is formal:** Nothing equates to formality like a written document, so we should think of the plan as a written document.
- **The project management plan is a single document:** The plan document itself contains all essential and subsidiary components. It is not a document that simply references other documents.
- **The project management plan is approved:** At some point an authority within the project accepts the plan. This could be the sponsor, project manager, organizational management, or the project organization (PMO management). Once the plan is approved, it's considered baselined, and any further changes to it are governed by integrated change control.
- **The project management plan can be summary or detailed:** The characteristics of the project (such as its scope, effort, cost, and risks) will affect how detailed the plan will be. Not all project management plans have to go into finite details as long as all major elements are covered. However, for the PMP examination, it'd be best for us to think of the plan as being an extremely detailed document.
- **The project management plan contains subsidiary plans:** The project management plan contains subsidiary plans, such as those that establish how the project's scope, schedule, cost, and quality will be planned for and managed. The detail that goes into these plans depends on the project's characteristics. These subsidiary plans may be simple paragraphs or full-fledged plans.
- **The project management plan is the first place to refer to:** Everything about the project is to be found in the plan. For our PMP examination, if we're presented with a question asking where to find project information, in lieu of a more specific choice, choose the project management plan.

Project management plan components



The project management contains the subsidiary plans needed for the project as well as some core components, which are all fully discussed in later chapters.

Core Components:



Baselines: The project plan includes the project scope, schedule, and cost baselines (and sometimes other baselines like quality). These baselines are collectively known as the **performance measurement baseline**. A baseline is what was originally planned for with any approved changes incorporated into it.

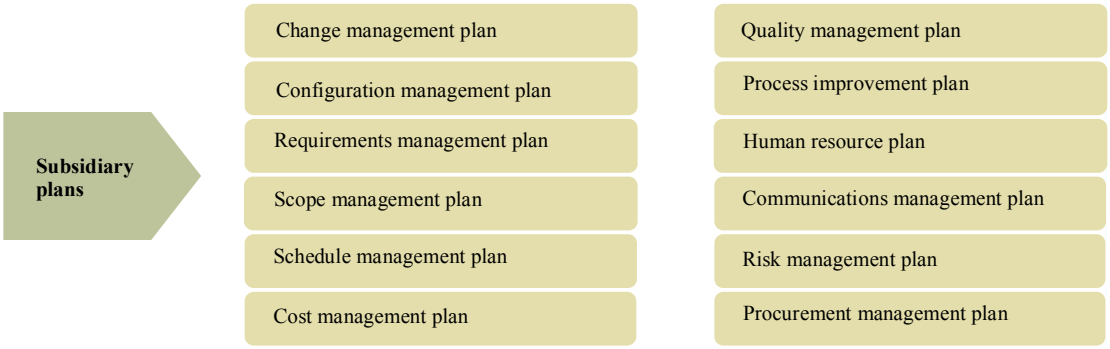
Milestone list: Milestones are important dates the project must meet, and they need to be included in the project management plan.

Resource calendar: This provides the schedule of when work will be performed by specific resources or when resources are needed, such as facilities or equipment.

Risk register: The risk register is a complete log of identified risks, how likely they are to occur, and what the risk response will be.

Open issues: Any open issues, including targeted dates and responsibilities for resolution, should be identified.

Project management subsidiary plans



The subsidiary plans are fully discussed in later chapters, but for now we should understand what the primary purpose of each subsidiary plan is.

Change management plan: This plan describes the integrated change control process.

Configuration management plan: This describes how configuration management will be performed on the project. The configuration management system defines configurable items, such as product specifications, and the change control procedures on those items (sections 4.5, 5.1).

Requirements management plan: Describes how the requirements will be elicited, analyzed, documented, prioritized, and managed throughout the project. Requirements drive the features and characteristics of the project's deliverables. This plan is created in the Collect Requirements process (section 5.1).

Scope management plan: Describes the processes for creating the scope and how the scope will be managed and controlled. This plan is an output of the Define Scope process (section 5.2).

Schedule management plan: Describes the processes for creating the schedule and how the schedule will be managed and controlled. The schedule management plan is not a named output of any specific process, but it should be established as part of the Develop Project Management Plan process (section 4.2).

Cost management plan: Describes how project costs will be estimated and the project budget created and structured. It also defines how the budget will be managed, controlled, monitored, and reported on. The cost management plan is not a named output any specific process, but it should be established as part of the Develop Project Management Plan process (section 4.2).

Quality management plan: Describes how the project will conform to the organization's quality policy. It describes the quality assurance, quality control, and continuous process improvement for the project. This plan is an output of the Plan Quality process (section 8.1).

Process improvement plan: Describes what processes will be used to analyze project performance with the aim of eliminating non-value added activities from the project. It is an output of the Plan Quality process (section 8.1).

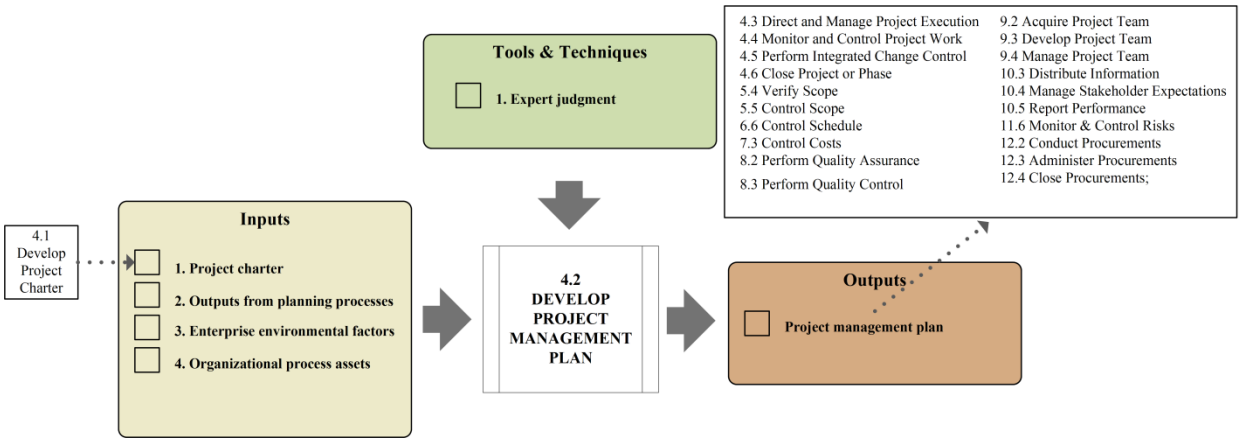
Human resource plan: Describes how project team members will be acquired and released from the project, what training will be required, reward and recognition plans, and any regulatory personnel requirements. This plan is an output of the Develop Human Resource Plan process (section 9.1).

Communications management plan: Describes the processes, mediums, methods, regularity, and responsibilities for project communication, particularly with stakeholders and within the project team. The communication management plan is an output of the Plan Communications process (section 10.2).

Risk management plan: Establishes the processes, responsibilities, responses, budget, structure, and categorization for project risks. This plan is an output of the Plan Risk Management process (section 11.1).

Procurement management plan: Describes the procurement processes for the project, including responsibilities, contract types allowed, metrics, standardized procurement documents, and insurance requirements. This plan is an output of the Plan Procurements process (section 12.1).

4.2 Process decomposition



Inputs

- ☐ **Project charter**
  The project charter formally authorizes the project and the project manager. It also provides the business case, objectives, and success criteria of the project. The charter provides the framework for project planning activities.
- ☐ **Outputs from planning processes**
  All of the outputs from the project management processes in chapters 5 through 12 are used to establish the project management plan, and any approved changes or updates to process components will usually require a correlating change in the project management plan.
- ☐ **Enterprise environmental factors**
  Any of the many enterprise environmental factors and systems that influence the project should be considered for their impacts on the project management plan. Those can include infrastructure, personnel hiring and firing practices, and availability of project management software (PMIS).
- ☐ **Organizational process assets**
  Organizational process assets are the source of existing policies, processes, organizational data and knowledge. Of special importance will be historical information from similar projects, organizational methodologies, project closure procedures, change control procedures, and the configuration management knowledge base is available.

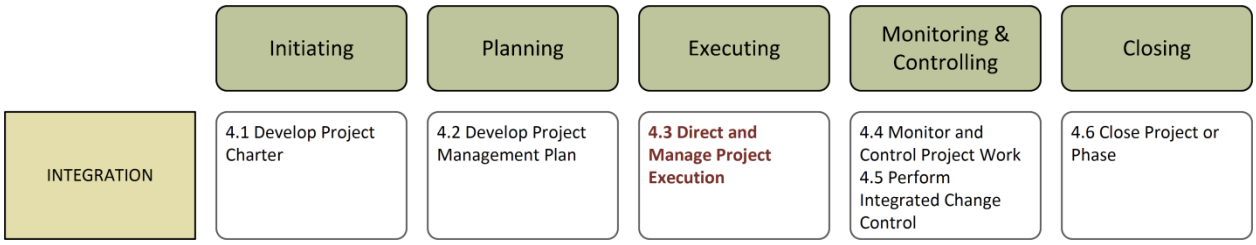
Tools and Techniques

- ☐ **Expert judgment**
  Expert judgment is based upon the experience and knowledge of subject matter experts. It's used to assess and evaluate the inputs and the information they contain.

Outputs

- ☐ **Project management plan**
  The project management plan details how the project will be executed, managed, and controlled, including many subsidiary plans as to how changes to major project components, such as scope, budget and schedule, will be handled, and how important factors such as communication, risk, and quality will be managed. The project management plan is the key source of information relating to project management for the project.

4.3 Direct and manage project execution



Direct and Manage Project Execution is the integrative process that encompasses all the work needed to produce the project's deliverables, whether they're directly related to the final product or part of the project management processes. Other knowledge areas contain processes that are focused on work specific to subject matters, such as conducting procurements, but Direct and Manage Project Execution is the dominant one for all executing tasks.

The exact activities occurring within Direct and Manage Project Execution will depend upon the application area of the project. For example, a house construction project would include activities like "pour concrete foundation" and "erect framing."

Some of the general activities within the Direct and Manage Project Execution include:

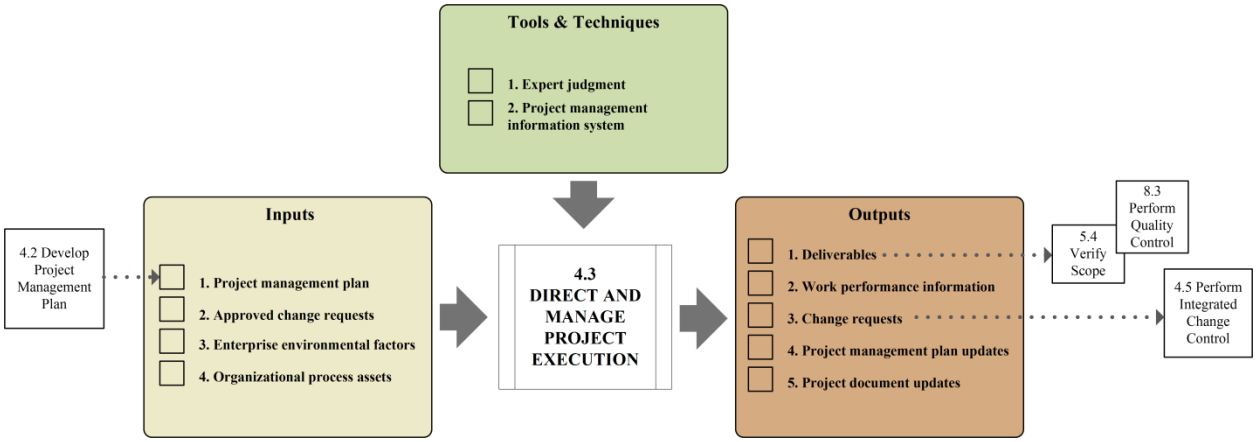
- Perform the activities that produce deliverables
- Obtain vendor quotes, bids, and offers
- Staff, train, and manage human resources needed for the project team
- Incorporate approved changes (which includes approved process improvement activities, approved corrective actions, approved preventative actions, and approved defect repair requests) into the project
- Collect and report on work performance information, such as status, cost, schedule, quality.

As work occurs on the project, changes are likely to be requested or found to be needed. There's a strong temptation to incorporate changes immediately in order to be responsive to the requestor, but changes, however small or large, to any approved portion of the plan or deliverables are always directed through the Perform Integrated Change Control Process.

Another important matter for the project manager to be watchful for is that once the project team begins working on the deliverables, that he or she can to buffer them from unnecessary distractions and meetings. The team's focus needs to be on performing the work that fulfills the scope.

> One of the biggest mistakes managers make is withholding praise or acknowledgement until after an employee has "been good" or done something to "deserve" it. You may have heard the old grass adage: You tell the grass, "When you grow, and only after you grow, will I then give you water." This is just not how motivation works. This kind of reward system demonstrates a fundamental misunderstanding of human nature and basic human needs. It breeds insecurity amongst employees, who may never function at their best over the long-term because they can never feel confident about what they're doing or where they stand.[3]
>
> Kurt Mortenson, author of Magnetic Persuasion

4.3 Process decomposition



Inputs

☐ **Project management plan**
The project management plan details how the project will be executed, managed, and controlled, including many subsidiary plans as to how changes to major project components, such as scope, budget and schedule, will be handled, and how important factors such as communication, risk, and quality will be managed. The project management plan is the key source of information relating to project management for the project.

☐ **Approved change requests**
These were requested changes that have been approved for implementation through the processes in Perform Integrated Change Control. Change requests can come about due to any reason, including scope changes, policy or procedural changes, cost or budget changes, or schedule changes.

☐ **Enterprise environmental factors**
Any of the many enterprise environmental factors and systems that influence the project should be considered. These factors can include its personnel, its organizational culture, its tolerance of risk, and its formal and informal hierarchy. Organizations may also have custom or commercial analytical databases that can include cost estimating, risk, or demographic data. Even elements outside the enterprise, like business conditions and political climate can influence projects.

☐ **Organizational process assets**
Organizational process assets are the source of existing policies, processes, organizational data and knowledge. These assets include the entire collection of formal and informal methodologies, policies, procedures, plans, and guidelines, as well as the organization's "knowledge base," which includes historical performance data, labor information, service and maintenance history, issue and defect history, project files, financial data, and so on.

Tools and Techniques

☐ **Expert judgment**
Expert judgment is based upon the experience and knowledge of subject matter experts. It's used to assess and evaluate the inputs and the information they contain.

☐ **PMIS**
The PMIS provide templates and automated tools that assist in the project management processes. A PMIS can include any number of components that might assist in processes relating to scheduling, resources, configuration management, change control, and issues management. A PMIS also provides methods to collect and distribute data the PMIS contains.

Outputs

☐ **Deliverables**
Deliverables are not just the final product, service, or result of the project. They include anything that's needed to produce the project's objectives and perform project management activities that are described in the project scope.

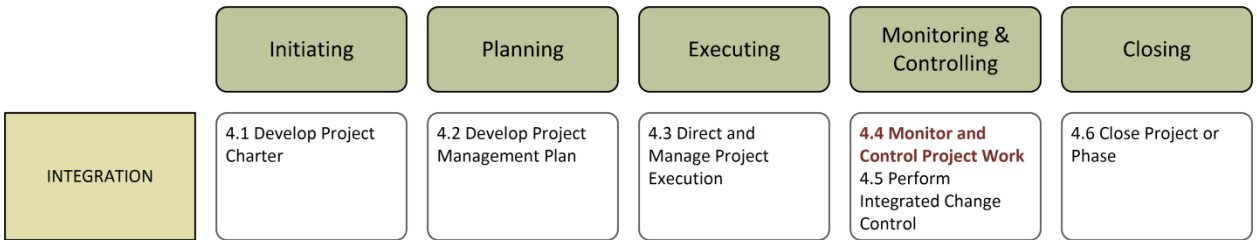
☐ **Work performance information**
Work performance information is any data that can be considered related to the work which produces the project deliverables. Examples are schedule and progress status information, budget and cost status, quality status, estimates to complete, resource utilization information, and lessons learned.

- **Change requests**
  While performing the project work, it's likely that changes are going to be requested and discovered. These are desired changes to the project scope, policies or procedures, cost or budget, or project schedule. These change requests from this process become inputs to the Perform Integrated Change Control process which will review, evaluate, and decide upon the change requests.

- **Project management plan updates**
  Approved change requests will be incorporated into affected components of the project management plan.

- **Project document updates**
  Approved change requests and work performance information will be incorporated into affected documents that aren't part of the project management plan. These could include items such as schematics, diagrams, meeting minutes, and logs.

4.4 Monitor and control project work



Activities in the **Monitor and Control Project Work** process start immediately after the project is initiated and continue all the way until closure, and they make sure that the project plan is being followed and also forecast future performance on the project.

Checking deliverables for missing requirements or subpar quality levels also falls within this process. This is done by collecting and measuring performance information and comparing what is actually happening within the project to what was planned for. It doesn't matter whether the variance is detrimental or beneficial to the project –if there's any alteration from the project plan it needs investigated.

The most common options to address variances include changing the project's scope, schedule, budget, staffing, quality levels, or risk strategies. But variances do not always mean that the performance level needs changed –in some cases the variances are acceptable or unavoidable, and so what will be pursued will be a change to the plan to accommodate the variance.

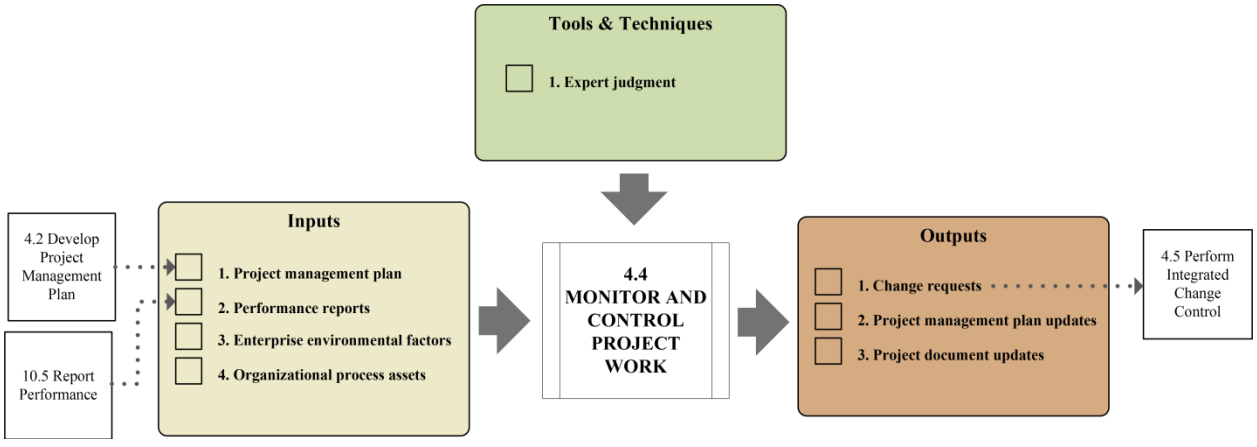
We're not looking only for current variances but also future variances based on current trends. Variances that are already occurring will require corrective actions while trends may need preventative actions. Neither corrective nor preventative actions are taken on the spur of the moment but are instead treated as change requests to be submitted to integrated change control for evaluation.

> Hard as it is to do, we need to handle bad news with appreciation. The team member with a variance is often not to blame and even if they are the culprit, we don't let on that we have reached that conclusion. We handle the variance as a problem we have to jointly solve. We want the team member to continue to trust us . . . If we discourage our team members from giving us bad news, we doom ourselves to discovering problems when it's too late to recover.[4]
>
> Dick Bellows, PMP, GCA, from Project Team: Moments of Truth and the Elephant

Some of the general activities in Monitor and Control Project Work are:

- Comparing the work that is occurring to the project management plan.
- Assessing work performance information to determine if any corrective or preventative actions are necessary.
- Analyzing, tracking, monitoring, and reporting on project risks.
- Providing status reports, accomplishments, and issue reports.
- Monitoring the implementation of approved changes.
- Making sure that approved defect repairs have been made.

4.4 Process decomposition



Inputs

- **Project management plan**
  The project management plan details how the project will be executed, managed, and controlled, including many subsidiary plans as to how changes to major project components, such as scope, budget and schedule, will be handled, and how important factors such as communication, risk, and quality will be managed. The project management plan is the key source of information relating to project management for the project.

- **Performance reports**
  These provide performance reporting on activities, accomplishments, and issues. They're an output of the communication process Report Performance (10.5).

- **Enterprise environmental factors**
  Any of the many enterprise environmental factors and systems that influence the project should be considered. These factors can include its personnel, its organizational culture, its tolerance of risk, and its formal and informal hierarchy.

- **Organizational process assets**
  Organizational process assets are the source of existing policies, processes, organizational data and knowledge. These assets include the entire collection of formal and informal methodologies, policies, procedures, plans, and guidelines, as well as the organization's "knowledge base," which includes historical performance data, labor information, service and maintenance history, issue and defect history, project files, and financial data.

Tools and Techniques

- **Expert judgment**
  Expert judgment is based upon the experience and knowledge of subject matter experts. It's used to assess and evaluate the inputs and the information they contain.

Outputs

- **Change requests**
  Variances will require requests for corrective actions, preventative actions, or defect repairs. These requests are submitted to the Integrated Change Control process (section 4.5).

- **Project management plan updates**
  Monitor and Control Project Work will likely result in changes to the project management plan throughout the project phases.

- **Project document updates**
  Monitor and Control Project Work will likely result in changes to a number of project documents while the project is underway.

4.5 Perform integrated change control

	Initiating	Planning	Executing	Monitoring & Controlling	Closing
INTEGRATION	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Execution	4.4 Monitor and Control Project Work **4.5 Perform Integrated Change Control**	4.6 Close Project or Phase

Activities in the **Perform Integrated Change Control** process make sure that all changes, regardless of how large or small, are logged, evaluated, reviewed, approved or rejected, and communicated.

Before we delve into change control, it's important that we see why rigorous change control is needed. We need to first recognize that *change* has very broad connotations within a project. Change is any proposed deviation from any part of the project management plan or any alteration to specifications, processes, and procedures. If an adjustment or correction is needed to the scope, schedule, activities, efforts, costs, budget, quality, staffing, risk components, resources, or contracts then that change will impact the project management plan, which if unmanaged can disrupt the project plan and work being done.

The other major type of change that can occur is one that results in a modification to specifications of the product or a process involved in creating the deliverables. These types of changes can be especially disastrous because on the surface they may seem to have nothing but beneficial impacts, but if unmanaged they can introduce ripple effects that go unnoticed until suddenly they result in mayhem.

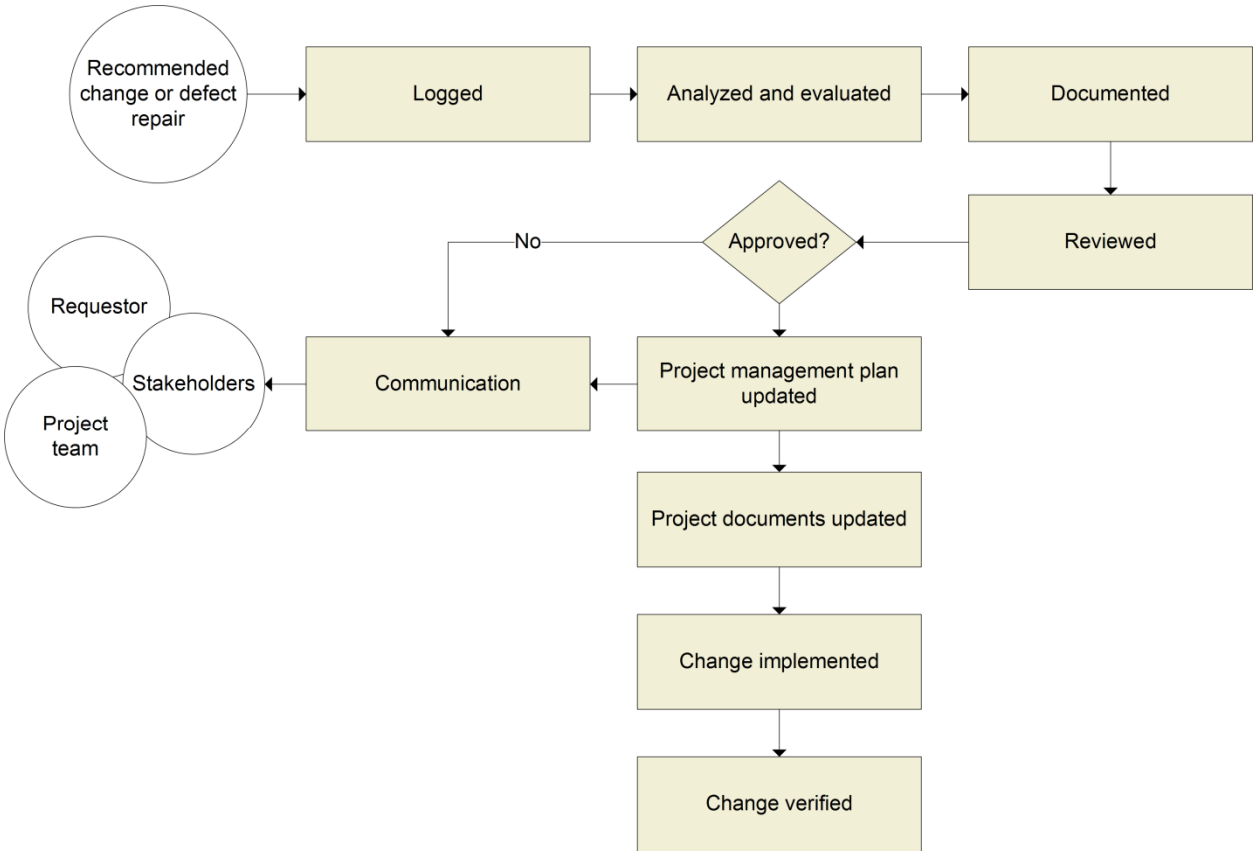
> Most large-scale technology projects involve transforming how parts of an organization work. This change can disrupt existing workflow processes and cause end-user morale problems. Recognize that change is difficult and allocate sufficient time and resources to help users with the transition. Don't consider change management and user education to be optional add-ons; they are essential ingredients for project success.[5]
>
> Michael Krigsman, CEO, Asuret, Inc.

But let's not get the wrong idea about change control --integrated change control is not about prohibiting changes to the project. Changes are necessary in order for the project team to be responsive and adaptable to evolving customer, organizational, and project management needs. Changes are usually driven by one of the following needs:

- **Value added:** The change would be beneficial to the deliverable or project.
- **External events:** The change is a reaction to an event triggered outside the project boundaries.
- **Errors or omissions:** The change is needed because of an oversight or defect, or the change is needed because the iterative nature of the project has exposed new knowledge.
- **Risk responses:** The change is needed to take advantage of an opportunity, reduce the chance of a negative event occurring, or is in response to an unplanned event that's currently taking place.

Change control provides us a mechanism to make sure that needed changes don't overwhelm the project and that they're properly managed by:

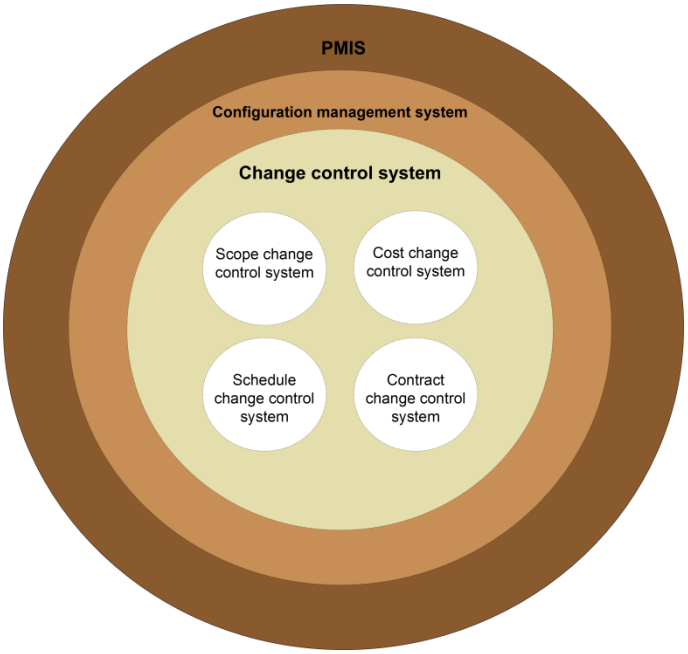
- Identifying and logging all requests for changes.
- Analyzing, evaluating, and documenting the impacts that the requested changes will have throughout the project.
- Defining a method for the formal review, make-up of the change control board, and decision-making authority of changes.
- Ensuring that communication is thorough and complete about all changes to the stakeholders and project team.



Change control systems

In the introduction to this section we talked about changes that affect project baselines, such as scope, and changes that impact specifications, processes, and procedures. The **configuration management system** manages the physical and intangible assets of a project while also encompassing the subsystem, called the **change control system**, which oversees changes to the project management plan. Both the CMS and CCS are usually part of the PMIS since they benefit from computerized tools.

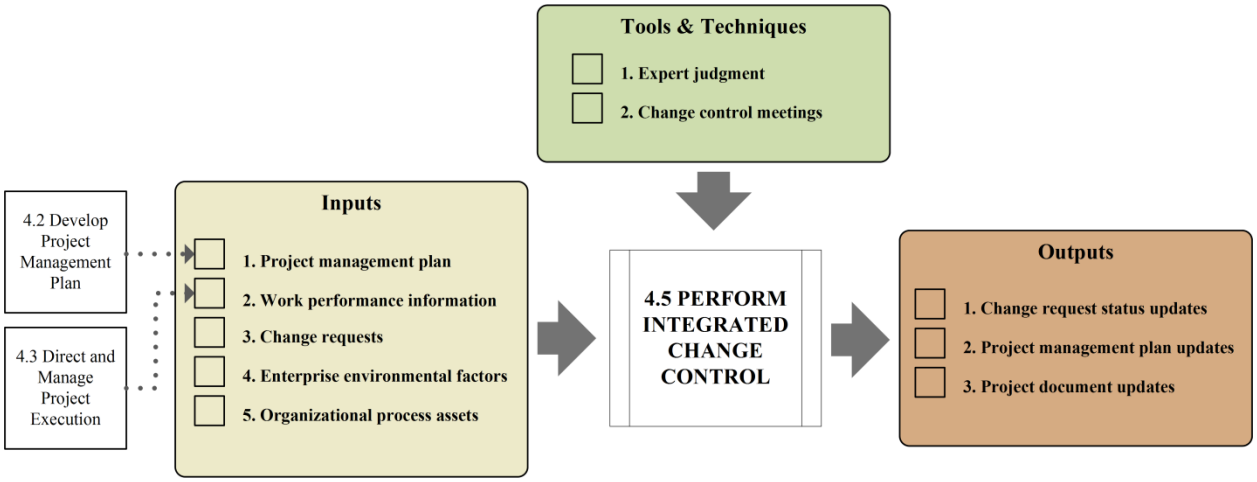
The configuration management system may be used to track, inventory, and report on the physical project assets like equipment. It can also be used to track product specifications, processes, policies, and procedures, providing an approval mechanism for changes to them. The change control system is a component of the CMS, but it is focused on changes that directly impact the project management plan, like scope, schedule, budget, quality, and risk.



Both systems ensure that all changes are logged, uniquely identified (usually through a numbering or coding mechanism), analyzed, evaluated for their impact on the project or product, reviewed, approved or declined, and incorporated into the project management plan if the change was accepted. Change control procedures also need to make sure that communication back to the change requestor occurs and that information on the change is distributed to the stakeholders and project team.

Change control procedures need to be fully documented and understood by everyone on the project team for both the change control and configuration management systems. The procedures that will be followed for project changes are documented in the **change management plan**, which is a subsidiary component of the project management plan. The change procedures may also be documented as part of the scope, schedule, cost, quality, risk, and procurement management plans. The **configuration management plan** is a separate component of the project management plan, and it will address what the configurable items are and describe the procedures for configuration management

4.5 Process decomposition



Inputs

☐ **Project management plan**
The project management plan details how the project will be executed, managed, and controlled, including many subsidiary plans as to how changes to major project components, such as scope, budget and schedule, will be handled, and how important factors such as communication, risk, and quality will be managed. The project management plan is the key source of information relating to project management for the project.

☐ **Work performance information**
Work performance information is any data that can be considered related to the work which produces the project deliverables. Examples are schedule and progress status information, budget and cost status, quality status, estimates to complete, resource utilization information, and lessons learned.

☐ **Change requests**
Change requests come from a variety of project processes and include corrective actions, preventative actions, defect repair, alterations to specifications, and modifications of policies and procedures.

☐ **Enterprise environmental factors**
The PMIS, a configuration management system, and web interfaces are the main factors that will help integrated change control.

☐ **Organizational process assets**
The organization may have standardized change control procedures as well as an enterprise-level configuration management system. If any organizational systems or policies exist, the project systems need to be coordinated with those of the organization.

Tools and Techniques

- ☐ **Expert judgment**
  Expert judgment is based upon the experience and knowledge of subject matter experts. It's used to assess and evaluate the inputs and the information they contain.

- ☐ **Change control meetings**
  These are some form of collaboration by the change control board, which is responsible for the disposition of change requests. The makeup and authority of the change control board and any decision-making authority outside of the board is explicitly defined in the project management plan.

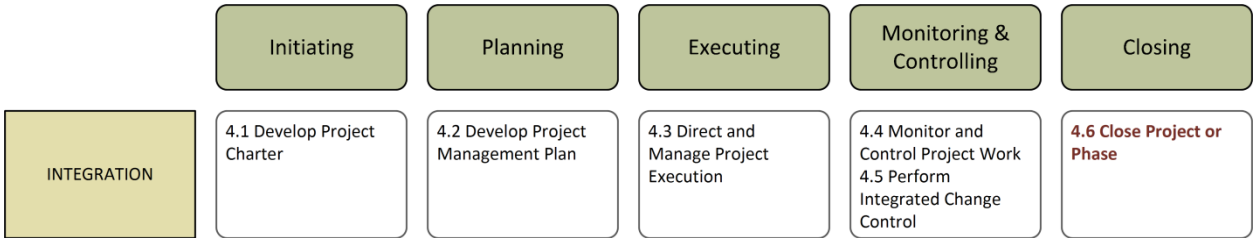
Outputs

- ☐ **Change request status updates**
  As change requests are processed by the change control or configuration management system, the log should reflect the current statuses of the requests.

- ☐ **Project management plan updates**
  Approved changes will usually result in changes to the project management plan, its subsidiary plans, or to any of the baselines.

- ☐ **Project document updates**
  All change requests will result in updates to the change request log, and may also result in updates to documents outside of the project management plan.

4.6 Close project or phase



The **Close Project or Phase** process is the formal completion of the project, or in multi-phase projects the closure of a phase. It includes making sure the project is finalized across all processes, and performing administrative closure procedures and contract closure procedures. This includes archiving project information and artifacts, documenting lessons learned, and providing final reports on project performance, including schedule, budget, and risks. Some activities may begin in this process even before the project as a whole is ready to enter the closing steps. Processes here are performed by the project manager, project management team, vendors, and the performing organization's management, as applicable. The Close Project procedure is also where the formal acceptance and handover of the final product, service, or result to the customer will take place.

The Close Project process occurs even if the project is canceled or otherwise terminated before fulfilling all its requirements. When a project is terminated, the project performance and deliverables are evaluated up to that point in time. The deliverables as they stand at termination are compared against where they were expected to be. It's also important to document the reasons the project was terminated as these contribute to the knowledge base for future projects.

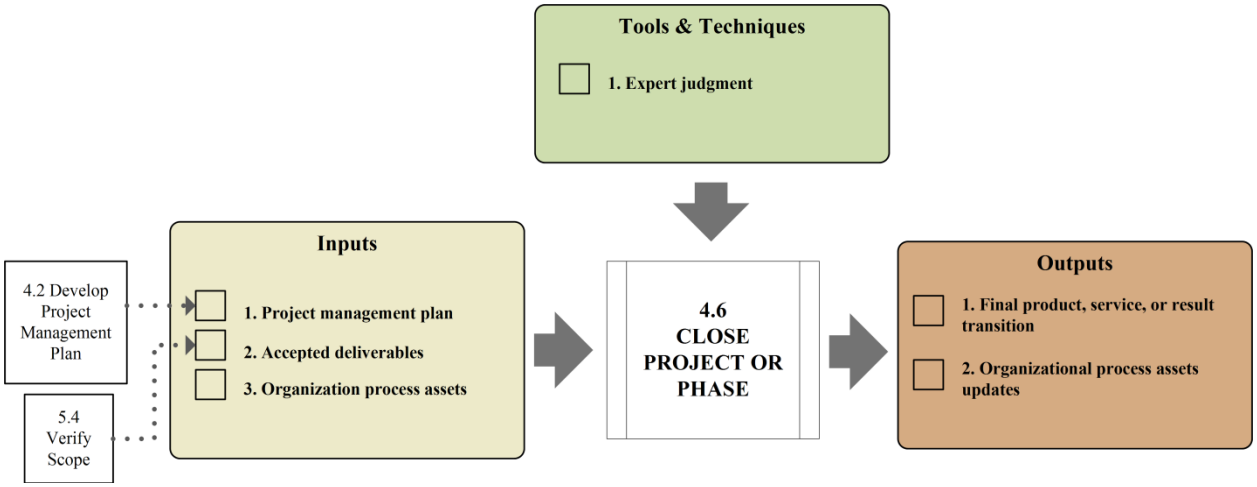
There are two main components to the Close Project process: Administrative closure procedure and the contract closure procedure. The administrative closure procedure details all the requirements of the performing organization and responsibilities for project closure. This includes making sure that all requirements have been met, including those of stakeholders, the sponsor, organization, and customer.

> In the busy IT project environment, projects occur at a fast and furious pace, and, at times, it may seem as if one project just flows into the next. But it is important to take the time to acknowledge actual project completion. Project closure is a sign of success and achievement, and should be treated as such. In this way, you can ensure that all your projects go out with a bang, and not a whimper.[6]
>
> ITtoolkit.com

The contract closure procedure focuses on the requirements and responsibilities to make sure all contracts are properly closed. It'll contain all activities and responsibilities to make sure all elements of the contract and exit criteria have been met. The Close Procurements process (section 12.4) will also establish contract-specific processes necessary. Contract documentation is also archived as part of the administrative closure procedure.

Part of the closure process involves making the knowledge, experience, and information about our project available to future projects by updating organizational process assets. We all want to move into the next project as quickly as possible, but it's important to take the time during the closure process to document lessons learned and archive the project files. Updates to the organizational process assets will include the documentation of the formal acceptance and turnover to the customer, project files, project closure documents, and historical information.

4.6 Process decomposition



Inputs

- ☐ **Project management plan**
  The project management plan details how the project will be executed, managed, and controlled, including many subsidiary plans as to how changes to major project components, such as scope, budget and schedule, will be handled, and how important factors such as communication, risk, and quality will be managed. The project management plan is the key source of information relating to project management for the project.
- ☐ **Accepted deliverables**
  These are the deliverables that have passed scope verification (section 5.4).
- ☐ **Organizational process assets**
  The organization may have standardized project or phase closure policies, templates, or guidelines.

Tools and Techniques

- ☐ **Expert judgment**
  Expert judgment is based upon the experience and knowledge of subject matter experts. It's used to assess and evaluate the inputs and the information they contain.

Outputs

- ☐ **Final product, service, or result**
  When the project is closed, the objective the project was undertaken can truly be considered in final form. In the case of phases, this refers to the intermediate result produced by the phase.

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Chapter summary

Project Integration Management is focused on unifying and coordinating all the project management processes in order to most efficiently produce the project's objectives. The project manager has to balance both a high-level view of the overall project and a detailed view of the project processes. Integration Management is about making time and resource choices, and also anticipating and resolving issues, conflicts, and managing changes.

Develop Project Charter is an initiating process with only one output --the project charter. The project charter formally authorizes the project and names the project manager, and it's issued by the project sponsor. The charter also provides the overall objectives of the project. The charter should include:

- the named project manager
- a description of the project or product
- the business case for the project
- expectations
- milestones, assumptions and constraints
- a summary budget
- known stakeholders and risks.

Projects without a charter are likely to encounter obstacles, such as resource allocation and prioritization conflicts.

The Develop Project Management Plan process produces the project management plan. The project management plan is the single, formal, approved document that describes how the project will be executed and monitored and controlled. The project management plan contains:

- the scope, schedule, and budget, collectively known as the project performance baseline
- milestones
- resource calendar
- risk register
- open issues log.

It also contains many subsidiary plans that describe specific management plans for the major project components. These are:

- configuration management plan
- requirements management plan
- scope management plan
- schedule management plan
- cost management plan
- quality management plan
- process improvement plan
- human resource management plan
- communications management plan
- risk management plan
- procurement management plan.

The project plan is developed iteratively by the entire project team, and changes in the project will result in updates to the project plan.

The Direct and Manage Project Execution process is where the work on the project's deliverables occurs. Though the specific activities will depend upon the application area of the project, common activities include procurement, validating project deliverables, collecting and reporting on work performance information, producing forecasts, and managing risks, communication, and developing the project team.

The Monitor and Control Project Work process is focused on collecting, measuring, disseminating, and forecasting project-related performance information and watching for variances from the project management plan. This process spans all process groups from initiating to closing. Activities in this process include comparing work actually performed to what was planned; assessing work performance information; monitoring risks; and distributing work performance information and forecasts. Variances from the project management plan will result in change requests

Perform Integrated Change Control makes sure that changes to the project are properly managed and coordinated throughout the entire project. The change control system is the documented procedures for how changes will be logged, tracked, approved/declined, and communicated within the project. The configuration management system coordinates and manages changes to product specifications. Approved changes result in updates to the project plan and baselines.

The Close Project or Phase process includes the activities to administratively close the project. If contracts are involved, they will also be double-checked that they have been closed and settled. Activities in this process include archiving project documents, lessons learned, communicating final work performance information, and closing out project files.

Exam summary

Project Integration Management

- ☐ Integration management is about integrating, unifying, and coordinating the project management processes and activities within the organization's project management methodology to produce the project's results.

- ☐ Integration management takes an overall view of the project.

Develop Project Charter

- ☐ The charter formally authorizes the project.

- ☐ The charter provides the project manager with authority.

- ☐ The charter links the project to the ongoing work of the organization.

- ☐ The charter documents the business needs, business case, initial customer requirements, and the project's ultimate objective.

- ☐ The charter is a formal document issued by the initiator or sponsor.

- ☐ The issuer of the charter is considered to be external to the project organization.

- ☐ Inputs to the Develop Project Charter process are:
  - contract
  - statement of work
  - business case
  - enterprise environmental factors
  - organizational process assets

- ☐ The sole output of the Develop Project Charter process is the project charter.

Develop Project Management Plan

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

- ☐ The project management plan is a single, formal document.

- ☐ The project management plan is approved by someone with authority to commit the organization's resources.

- ☐ The project management plan includes:
  - milestones
  - resource calendar
  - performance baselines (scope, schedule, cost)
  - issues log
  - risk register

- ☐ The project plan also includes subsidiary plans:
    - configuration management plan
    - requirements management plan
    - scope management plan
    - schedule management plan
    - quality management plan
    - process improvement plan
    - human resources management plan
    - communications management plan
    - risk management plan
    - procurement management plan

- ☐ The project management plan is updated through the Integrated Change Control process.

- ☐ Inputs to the Develop Project Management Plan process are:

    - project charter
    - outputs from other planning processes (sections 5 through 12)
    - enterprise environmental factors
    - organizational process assets

- ☐ The sole output of the Develop Project Management Plan process is the project management plan.

Direct and Manage Project Execution

- ☐ The Direct and Manage Project Execution process is includes the work to create the project deliverables.

- ☐ The actual work required to fulfill the project scope statement is also managed through this process. Some of those activities may include: staff, train, and develop project team members; procurement activities, such as obtain quotes, bids, offers, and choosing sellers; create and verify project deliverables; manage risk and implement risk response activities; collect work performance information; and adopt approved changes into the project activities.

- ☐ Inputs to the Direct and Manage Project Execution process are:
    - project management plan
    - approved change requests
    - enterprise environmental factors
    - organizational process assets

- ☐ Outputs of the Direct and Manage Project Execution process are:
    - deliverables
    - work performance information
    - change requests
    - project management plan updates
    - project document updates

Monitor and Control Project Execution

- ☐ The Monitor and Control Project Execution process is concerned with variances to the project plan. This includes monitoring for variances and taking corrective, preventative, or defect repair actions.

- ☐ This process also includes collecting, measuring, and disseminating project performance information as well as forecasting activities.

- ☐ Activities in this process include:
    - comparing work that is occurring to what was planned for in the project management plan
    - assessing work performance information, and taking actions necessary to bring the work back in line with the plan or to alter the plan
    - analyzing, tracking, monitoring, and reporting on risks
    - communicating work performance information and forecasts
    - monitoring the implementation of approved changes

- ☐ Inputs to the Monitor and Control Project Execution are:
    - project management plan
    - performance reports
    - enterprise environmental factors
    - organizational process assets

- ☐ Outputs of the Monitor and Control Project Execution process are:
    - change requests
    - project management plan updates
    - project document updates

Perform Integrated Change Control

- ☐ Perform Integrated Change Control is the process through which all project changes are managed.

- ☐ Change control is necessary to ensure that the impact of changes is properly managed across the entire project.

- ☐ Only approved changes are implemented.

- ☐ Approved changes result in changes to the project management plan (scope, cost, budget, schedule, or quality).

- ☐ The Configuration Management System (CMS) is part of the project management information system (PMIS).

- ☐ The Change Control System (CCS) is a subsystem of the configuration management system.

- ☐ The change control system is where all changes (both requested and denied) for the project are logged and tracked.

- ☐ The change control system documents the approval process for changes.

- ☐ Approved changes result in updates to the project management plan.

- ☐ The change control board (CCB) is responsible for approving or rejecting requested changes.

- ☐ Defect repair also begins as a change request.

- ☐ Inputs to the Integrated Change Control process are:
    - project management plan
    - work performance information
    - change requests
    - enterprise environmental factors
    - organizational process assets

- ☐ Outputs of the Integrated Change control process are:
    - change request status updates
    - project management plan updates
    - project document updates

Close Project or Phase

- ☐ The Close Project or Phase process involves formally and officially closing the project. It includes administrative closure (formal acceptance of deliverables, project artifact archival, communication, final performance reports) and contract closure (settling and closing all contracts).

- ☐ The Close Project or Phase process is performed once for every project, even if the project is terminated before its objectives are reached.

- ☐ In multi-phase projects, phases may undergo a phase closure process.

- ☐ Inputs to the Close Project or Phase process are:
    - project management plan
    - accepted deliverables
    - organizational process assets

- ☐ Outputs of the Close Project process are:
    - final product, service, or result
    - organizational process assets updates