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AAPM - IPMC OFFICE OF PM PROJECT SCIENCE

PROJECT MANAGEMENT GUIDE

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ABOUT THIS GUIDE

Project Management is a challenging undertaking for any organization. We hope that the guidelines given in this document will help those undertaking a project for the first time and also those who have been involved with many projects.

Organization of the Guide

We provide an Introduction, which is a summary of the Project Management Processes relative to the five standard process groups from the *Project Management Commission* (IPMC). Sections One through Five provide guidance on the use of these five government and IPMC recognized process groups and also the roles and responsibilities of those involved with a project. In general, we limit the chapter structure to two levels of detail.

When we introduce a new term or key phrase in the text for the first time, we print the term or phrase in italics to indicate that it is defined in the glossary.

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INTRODUCTION

Overview

The Project Management department's mission is to create a culture, which is experienced and effective in delivering products and services using the *generally accepted* disciplines associated with successful project management.

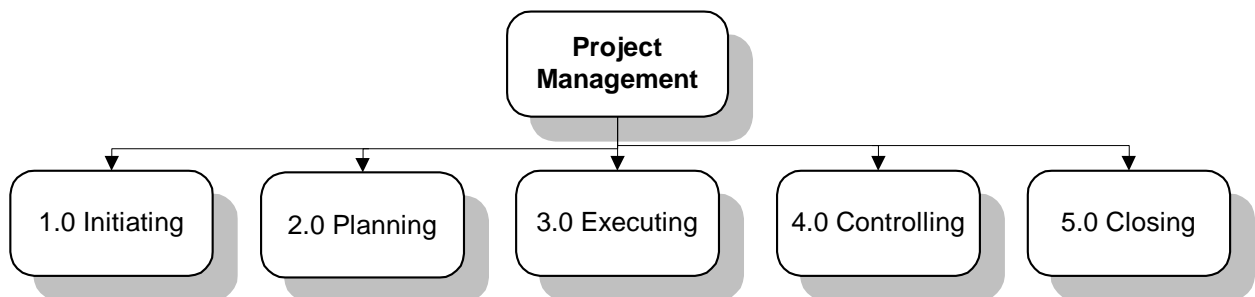
Generally accepted means that the knowledge and practices are applicable to most projects, most of the time, and that there is widespread consensus about their value and usefulness.

The purpose of applying project management processes is to increase the likelihood that a project will produce a solution for the specified business issue within the agreed and documented time, cost, and scope constraints.

Project Management Process Model

This document describes Project Management Processes. It communicates a path of actions that constitute a project. We expect that a project will tailor the steps outlined in this document to fit its resources, timeline, and scope or business objectives.

The model shown depicts the five phases of a project.



1.0 Initiating

Recognizing that a project or phase should begin and committing to do so.

2.0 Planning

Devising and maintaining a workable scheme to accomplish the business need that the project was undertaken to address.

3.0 Executing

Coordinating people and other resources to carry out the plan.

4.0 Control

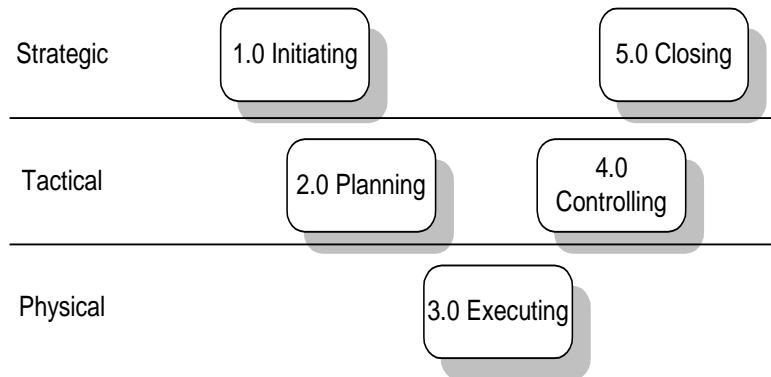
Ensuring the project objectives are met by monitoring and measuring progress and taking corrective action when necessary.

5.0 Closing

Formalizing the acceptance of the project or phase and bringing it to an orderly end.

Applying the Model

The project management processes and disciplines are not intended for the project manager alone. The processes apply at three levels within an organization and to various roles on a project.



- Strategic Level** The strategic level, (management and sponsorship), based on the organizations business needs and drivers, provide scope, guidance, resources and priority for the tactical processes.
- Tactical Level** The tactical processes, (project manager and support), develop and maintain the project plan, and manage and control the project.
- Physical Level** The physical level, (technical lead engineer and project staff), create the product by executing the processes as detailed in the project plan.

Phase Overlaps

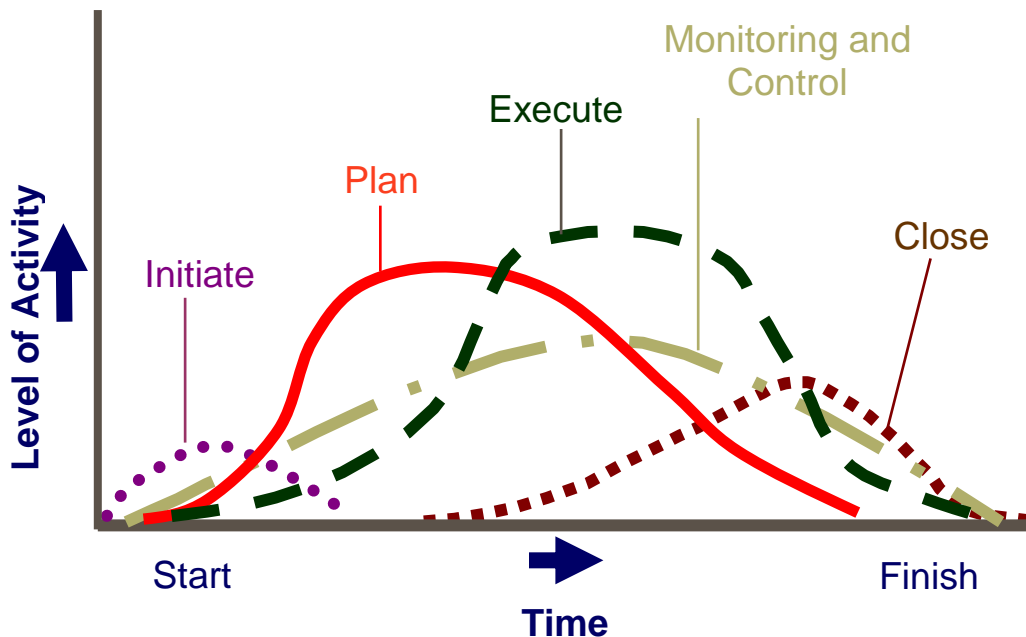
We have specifically chosen to use the project process groups' names as the names of our primary phases of a project. This has proven very beneficial in changing the cultural to understand and adopt the concepts of project management. It is important to note that the length of time it takes to complete a phase will vary from project to project and, in practice, the phases will overlap as depicted below. On large projects each phase will go through these processes.

Some Assembly Required: One Size Does Not Fit All!

This guide is organized in a best-case scenario. There will always be real-world events that prevent projects from following the set sequence. Projects must tailor these guidelines to their particular situation. Because it is difficult to allocate time for organizing and planning later in the project, project leaders must make sure that time is allocated up front to accomplish these activities. Clear understanding of what will be done, why, by whom, and when it will be done will be invaluable for maintaining the momentum of a project.

Process Overview Reference

The following provides an Overview Reference of 20 key process activities grouped by phase:



**PROJECT MANAGEMENT – OVERVIEW REFERENCE
20 KEY PROCESS ACTIVITIES**

INITIATING

ACTION	EXPECTED RESULT	RESPONSIBLE
1. DEMONSTRATE PRODUCT OR SERVICE NEED AND ORGANIZATION READINESS	<ul style="list-style-type: none"> • A product description document confirming the need for the product or service is created and defines in broad terms: <ul style="list-style-type: none"> • The expected end product or result to be achieved. • Benefits to be obtained by producing a solution. • Level of organizational impact and readiness for this product and change • Assessment of work complexity to determine if the risks warrant managing it as a project and how much should be applied. • Assessment of the Business Transition Management complexity • An Exec. Summary, which provides the main points of the product description and assessment results, is prepared to request decision. ➤ Clearly articulated the business case or rationale for why this change is needed ➤ Communicated how this Initiative relates to the overall vision, strategy, and mission of project ➤ Identified all stakeholders ➤ Ensured the project was aligned with the strategic goals of the organization ➤ Was strongly motivated to change current operations 	Initial Champion(s)
2. PRESENT CONCEPT FOR MANAGEMENT APPROVAL	<ul style="list-style-type: none"> • A “go/no go” decision is made by management to charter a project or a phase of a project. The Executive Summary is filed with P&P. • A sponsor and project manager is assigned. ➤ Provided a clear definition of the overall goals and objectives for this Initiative ➤ Communicates strong ownership and personal commitment for this change ➤ Knew concepts of project management methodology ➤ Is tenacious in pursuit of objectives of this change ➤ Invested effort to build broad support for this change ➤ Maintains a good working relationships with those who are implementing the change (the Initiative Team) ➤ Provided participants with skills and techniques to enable better understanding of project management practices, roles & responsibilities, etc. 	Initial Champion(s) and Mgmt
3. OBTAIN PROJECT AUTHORIZATION	<ul style="list-style-type: none"> • A project charter is created to obtain agreements on: <ul style="list-style-type: none"> • The level and amount of planning and controls. • The funding source(s) and budget authority. • Other group involvement. • Assignment of resources to complete planning activities. ➤ Maintains a good working relationships with the people who are impacted by the change (change targets) 	Sponsor and Project Manager (PM)

PLANNING

ACTION	EXPECTED RESULT	RESPONSIBLE
4. DESCRIBE PROJECT SCOPE	<ul style="list-style-type: none"> • Statement of project or phase scope. ➤ Sets direction for the project defining what will be accomplished ➤ Set SMART goals for the project including budget, risk, resource, etc limits ➤ Set expectations for all project team members ➤ Showed appreciation to executive management for promoting good practices and influencing the outcome of projects ➤ Confirmed all resources allocated to project are available ➤ Identified and communicated internal project priorities (Scope, Quality, Time) ➤ Wrote and communicated exit strategy addressing steps to take for failing projects • Project and Business Change Management Plans ➤ Communicates a clear understanding of the impact of this change on each target group ➤ Is tenacious in pursuit of objectives of this change ➤ Historical information of successfully implementing change in the organization will be made available for reference during and after project life 	PM, Sponsor and Planning Team (PT)
5. DEFINE AND SEQUENCE ACTIVITIES	<ul style="list-style-type: none"> • An activity list (list of all activities that will be performed on the project). • Create a sequenced work breakdown structure (WBS). ➤ Documented key deliverables ➤ Listed review points in the project life cycle ➤ Prioritized activities and resources in the agency to reflect the importance of the change 	PM and PT
6. ESTIMATE ACTIVITY DURATION AND RESOURCES	<ul style="list-style-type: none"> • Estimate of duration for each activity and estimate assumptions. • Statement of resource requirements. • Updates to WBS. 	PM and PT
7. CREATE A QUALITY PLAN. (OPTIONAL)	<ul style="list-style-type: none"> • Quality Management Plan including operational definitions. • Quality verification checklists. ➤ Historical information of successfully implementing change in the organization made available for reference 	PM and PT
8. CREATE A PROJECT COMMUNICATIONS PLAN. (OPTIONAL)	<ul style="list-style-type: none"> • Used the organization's standardized Project Management forms • A Communication Management Plan, including: <ul style="list-style-type: none"> • Identification of communication group recipients. • Description of type of communications to be given and by whom. <ul style="list-style-type: none"> ➤ Communicated in a manner that promoted a problem-solving climate ➤ Communicated in a manner that encouraged direct feedback • Schedules listing when information will be produced. • A method for updating the communications plan. 	PM and PT
9. DEVELOP A PROJECT SCHEDULE.	<ul style="list-style-type: none"> • Project schedule in the form of Gantt charts, network diagrams, milestone charts, or text tables. • Supporting details, such as resource usage over time, cash flow projections, order/delivery schedules, etc. <ul style="list-style-type: none"> ➤ Reviewed the project plan, status reports, and change requests ➤ Provided progress/status reports at steering committee meetings ➤ Responded to change requests in a timely manner ➤ Committed the resources necessary to achieve the objectives of this change 	PM and PT

10. ESTIMATE COSTS	<ul style="list-style-type: none"> • Cost estimates for completing each activity. • Supporting detail, including assumptions and constraints. ➤ Committed the resources necessary to achieve the objectives of this change 	PM and PT
11. ORGANIZE AND ACQUIRE STAFF.	<ul style="list-style-type: none"> • Role and responsibility assignments. • Organizational chart with detail as appropriate. • Project staff and staffing plan. • Project standards and directory setup. ➤ Demonstrated strong communication skills in the past, providing clear, concise, and understandable messages during previous implementations ➤ Maintains a good working relationships with the people who are impacted by the change (change targets) ➤ Committed the resources necessary to achieve the objectives of this change 	PM and PT
12. PLAN FOR ACQUIRING OUTSIDE RESOURCES. (OPTIONAL)	<ul style="list-style-type: none"> • Procurement Management Plan describing how contractors will be obtained. • Statement of work (SOW) describing the product /service needed. • Bid documents, such as RFP (request for proposal) etc. • Evaluation criteria -- means of scoring contractor's proposals. ➤ Demonstrated strong communication skills in the past, providing clear, concise, and understandable messages during previous implementations 	PM and PT
13. BUILD BUDGET AND SPENDING PLAN.	<ul style="list-style-type: none"> • A cost baseline or time-phased budget for monitoring costs, reporting variances and indicating, how much will be spent on what resources at what time ➤ Committed the resources necessary to achieve the objectives of this change 	PM and PT
14. IDENTIFY RISKS AND RESPONSE PLAN. (OPTIONAL)	<ul style="list-style-type: none"> • A document describing potential risks including their sources, symptoms, and ways to address them. ➤ Communicated when project should be cancelled to avoid excessive risk 	PM and PT
15. INTEGRATE THE PROJECT PLANS	<ul style="list-style-type: none"> • A Comprehensive Project Plan that integrates all the outputs of the preceding project planning activities. ➤ Project direction was outlined in the Integrated Project Plan 	PM

EXECUTING

ACTION	EXPECTED RESULT	RESPONSIBLE
16. EXECUTE PROJECT ACTIVITIES	<ul style="list-style-type: none"> • Work results (deliverables) are created. <ul style="list-style-type: none"> ➤ Balanced needs of the organization with the needs of the customer, ensuring customer needs did not dominate the process ➤ Resolved conflicting needs as appropriate – sometimes the passage of time assuages conflicts • Change requests are identified • Team performance is assessed, guided, and improved if needed. <ul style="list-style-type: none"> ➤ Focused reinforcement strategies on his/her direct reports • Bids/proposals for deliverables are solicited, contractors (suppliers) are chosen, and contracts are established. • Contracts are administered to achieve desired work results. <ul style="list-style-type: none"> ➤ Offered appropriate level of support without micromanaging the project 	PM and Project Team

CONTROLLING

ACTION	EXPECTED RESULT	RESPONSIBLE
17. COLLECT AND DISSEMINATE PERFORMANCE INFORMATION	<ul style="list-style-type: none"> • Monitoring of project schedule, cost, and scope. <ul style="list-style-type: none"> ➤ Established mechanisms for gathering data to monitor the progress of the project and organizational change • Decision to accept inspected deliverables. • Preparation of Status and Performance Reports • Analysis of project performance information and forecasting <ul style="list-style-type: none"> ➤ Communicates in a manner that encourages direct feedback ➤ Demonstrated personal support privately to direct reports to generate their commitment to change ➤ Tied reinforcement directly to specific behaviors both from an objective setting (or performance appraisal) basis and a daily reinforcement perspective ➤ Made both positive and negative reinforcement predictable, certain and immediate following behaviors ➤ Made old, undesired behaviors obsolete ➤ Reinforced and performed new, desired behaviors ➤ Emphasized formal and informal work unit reward and recognition, as well as acknowledged individual accomplishments 	PM or Project Coordinator
18. COORDINATE CHANGES ACROSS PROJECT	<ul style="list-style-type: none"> • Analysis of change, cross project impacts, and tracking <ul style="list-style-type: none"> ➤ Communicates a clear understanding of the impact of this change on each target group ➤ Communicates in a manner that encourages direct feedback • Updates to impacted parts of Integrated Project Plan. • List of lessons caused by variances <ul style="list-style-type: none"> ➤ Places stronger emphasis on rewards for achieving the change versus punishment for failure ➤ Linked intrinsic rewards (e.g. doing your best solving an important problem or providing the highest quality) to the achievement of the change ➤ Acted as a liaison to steering committee 	PM

<p>19. FACILITATE CHANGE, QUALITY MONITORING AND RISK RESPONSE</p>	<ul style="list-style-type: none"> • Determine and manage change to scope, schedule, costs, and organization ➤ Is tenacious in pursuit of objectives of this change ➤ Demonstrated personal changes in behavior that reflect or symbolically demonstrate the change ➤ Invested effort to build broad support for this change ➤ Removed obstacles and resolved issues PT not authorized to manage ➤ Communicates in a manner that encourages direct feedback ➤ Publicly pinpointed specific behaviors that must change ➤ Places stronger emphasis on rewards for achieving the change versus punishment for failure • Corrective actions such as rework of deliverables, adjustments to work process, etc. • Responding to risk via mitigation or contingency • Quality Control Reviews and Checklist updates ➤ Historical information of successfully implementing change in the organization is available for reference 	<p>PM and Project Team</p>
<p>CLOSING</p>		
<p>ACTION</p>	<p>EXPECTED RESULT</p>	<p>RESPONSIBLE</p>
<p>20. CLOSE OUT PROJECT ACTIVITIES</p>	<ul style="list-style-type: none"> • Formal acceptance documented in writing, that the sponsor has accepted the product of this phase or project. • Formal acceptance of contractor work products and updates to the contractor's files. • Project Evaluation. • If government funded, please follow guidelines of Government Mandates ➤ Communicates in a manner that encourages direct feedback ➤ Able to identify needed information for project completion process • Updated project records prepared for archiving. • A plan for follow-up and/or hand-off of work products. ➤ Historical information of successfully implementing change in the organization is available for reference 	<p>PM and Sponsor</p>

1.0 INITIATING

Purpose Recognizing that a project or phase should begin and committing to do so.

Overview Here is where the initial business need is established, the primary roles and responsibilities for a project are defined, and initial resources are assigned. In this phase the business goals are defined. They are established from the business needs of the organization and will be refined and made specific during the Executing phase. The project charter is created to direct the *Project Team* in planning the project or next phase of a large project. Approval to start a project is obtained along with a commitment of future resources for the job ahead.

The initial *Project Leadership Team* to support and facilitate the project is defined. Four key leadership roles typically defined and agreed upon before the project starts the planning phase are the project sponsor, the project steering committee, the project manager, and in some cases the technical lead. A general approach or life cycle model is chosen for planning and executing the project. The amount and level of project controls are identified based on project risk and complexity. The Project Leadership Team's agreement on lifecycle model and project controls focus how the project is planned, controlled, and executed.

The deliverables of the initiating phase provide all affected participants with a common point of reference and reduce risk of project misunderstanding when the project is underway.

Objectives

1. To obtain a common understanding of the business need or issue to be resolved by the project or phase.
2. To provide clear and, as far as possible, verifiable or quantifiable business objectives that a solution must deliver.
3. To provide a high level understanding of the organizations readiness for change and the level of impact this project will have on the organization.
4. To provide the initial scope on which the project will be planned.
5. To obtain sponsorship, organizational commitment, and assign key leadership roles.
6. To obtain an agreement on how the project will be planned and managed.

Initiation Lessons

Common lessons learned from skipping or poorly executing the initiation phase are:

- Disagreement or dissatisfaction with/from the customer on what was to be delivered.
- Inability to distinguish if the business issue or need has been resolved – or what constitutes the end of a project or phase.
- Inadequate or unknown sponsorship and leadership direction.
- Severely over planned or under planned project.
- Severely lengthening the time it takes to plan a project.
- Organization is not ready for and/or does not accept the delivered project due to resistance to change

Inputs to Initiation

1. **Product Description or DEPARTMENTAL Business Case.** The product description or business case documents the characteristics of the product or service that the project is to create.
2. **Strategic Plans.** All work requests should be supportive of the DEPARTMENTAL Strategic Business Plan– the strategic plans of DEPARTMENTAL should be considered as a factor in choosing to move forward with a project.
3. **Project Selection Criteria.** Criteria that aids in determining:
 - If a piece of work should be managed as a project.
 - The Level of potential project complexity, risk, and size.
 - The level of project management required.
 - The level of business change management required.
4. **Historical Information.** Information pertaining to prior projects or related work should be considered to the extent available. When initiation involves approval for the next phase of a project, information about the results of previous phases is often critical.

**Initiating -
Process
Activities**

The process is a course of proven actions used to guide the organization through the initiating phase. Performing these activities has been proven to reduce the amount of risk and rework in later phases of a project.

**It's a work
process – not
document
creation**

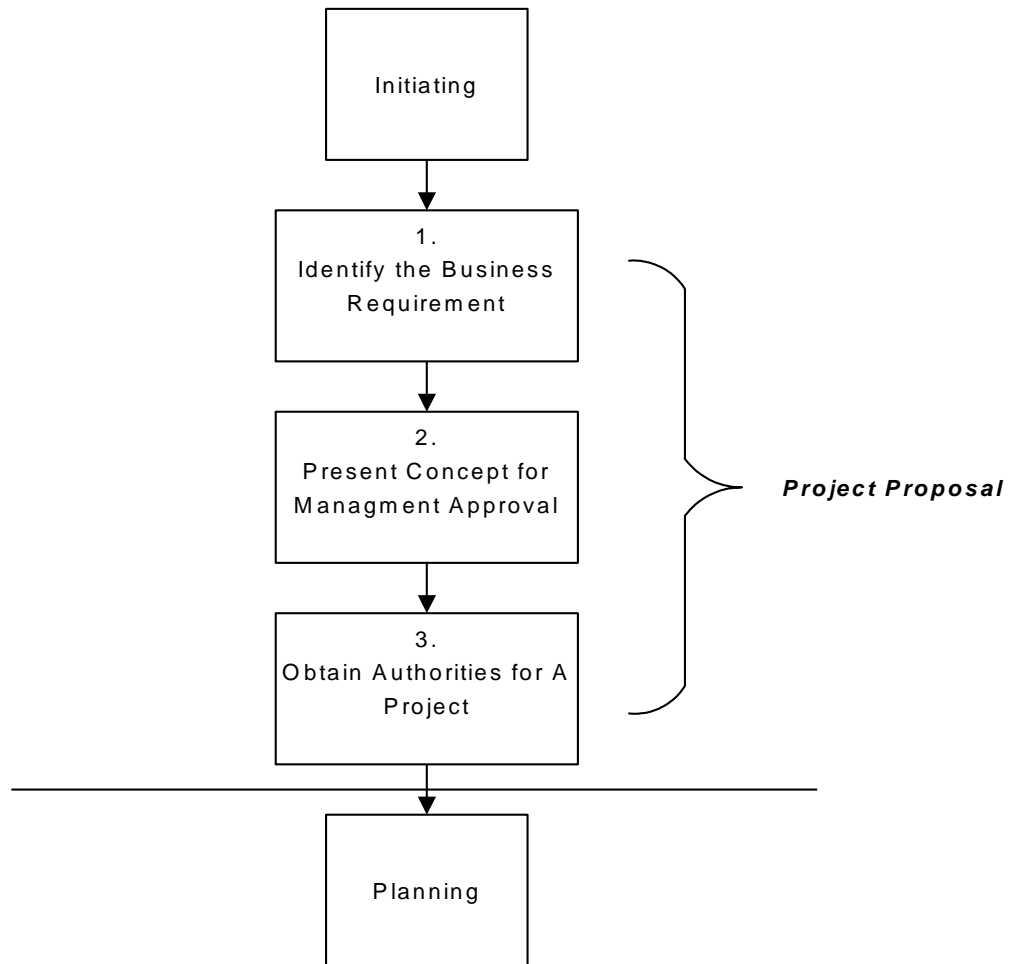
Performing the process is the primary effort, not creating a document. Creating the document or deliverable is secondary.

The processes are intended to obtain a common understanding and agreement. Writing the information down informally (white board, e-mail, notes) facilitates the evolution of a common understanding and agreement.

Once broad understanding is obtained, formulating an accurate, concise, and readable deliverable from the information is appropriate. Using a deliverable template provides an organizationally consistent method to document project information.

The process activities are diagramed and then followed by brief discussion of each activity. The diagram is numbered to correspond to the "Project Management – Overview Reference" located in the Introduction of this process guide.

Each process step number and title is indicated in bold in the left hand column. In addition to the title the recommended template to document the outcomes of the process step is indicated in parentheses.



Each of the activities are briefly described below:

1. Identify the Business Requirement

The purpose of this activity is to quickly establish a common understanding of the business need or problem to be resolved between the initial champion(s) of the idea and OIS. These efforts are best achieved first informally (e-mail, notes, etc.), and then more formally by recording the outcomes in the product description template for future reference and as an aid in decision-making.

Establishing a common understanding involves discussing and confirming the need for the product or service, defining--in broad terms the expected end result, as well as the benefit to be obtained by producing a solution. The bulk of this information should be obtained in a single informal meeting.

Once an initial understanding of the request is established, a simple assessment of the work complexity is conducted to determine if the risks warrant managing it as a project and how much project management should be applied.

It is best to summarize the results of these two activities to take to an appropriate level of management within the organization in order to obtain a decision chartering the effort as a project. An Executive Summary, which provides the main points of the product description and assessment results, is prepared to request decision.

It is important to note that the goal of this activity is to avoid spending a lot of time and resources to get to this point in the process.

2. Present Concept for Management Approval

The next step is to get concurrence that the concept should move on into a planned work effort, or be canceled or shelved until a later point in time.

The concept is then presented to management. In some cases this may be an escalation of presentations, i.e. business management, Executive Staff, Steering Committee. In other cases it will be a meeting between an Dept. manager, and business manager.

The Executive Summary is presented for a “go/no go” decision to charter a project or a phase of a project. It is suggested that when presenting the Executive Summary you include a cover page that identifies the decision desired/needed from the person or group. A template “Decision Request” is optional. It can be found in the section tabbed “Controlling Templates.”

In addition to getting a decision to proceed with chartering a project, a single sponsor and project planner should be assigned at minimum.

3. Obtain Authorities for a project

The final activity is to obtain agreements on how the project should be planned and managed. The sponsor and project manager work together to create a project charter.

The agreements to be obtained include reasonable amounts of planning and controls for the project. The Business and Technical Complexity assessment gives guidelines to assist in selecting the appropriate levels of planning and controls.

Funding source(s) and budget authority must be established. If project is to be government funded, please review local laws.

Other groups that are to be involved with the project must be identified and notified that they will be included:

- A project charter is created to obtain agreements on:
 - The level and amount of planning and controls.

- IPM The funding source(s) and budget authority.
- Other group involvement.
- Assignment of resources to complete planning activities.

Output from Initiation

1. **Charter Updated and Signed.** The product charter confirms agreement on the business goal and need that gave rise to the project, (i.e. change in business, technological advance, legal requirement, problem, or opportunity). It includes the primary product objectives in support of the business goal and need that will be a measure of the project's success as well as initial insights into the complexity of the effort and the potential change impact to the business. A signed project charter formally recognizes the existence of a project. It provides the project manager and project team with clear guidance on how the project should be planned and managed. It describes primary roles, responsibilities, and authority.
2. **Project Leadership Team Identified/Assigned.** In general, the leadership team should be identified and assigned as early in the project as feasible. Preferably before much project planning has been done.
3. **Constraints.** The factors that limit the project leadership team's options regarding scope, staffing, scheduling, and management of the project.
4. **Assumptions.** The factors that, for planning purposes, will be considered to be true, real, or certain. For example, if the date that a key person will become available is uncertain, the team may assume a specific start date.

Tools and Techniques

The tools and techniques of the Initiating Phase assist the organization in assessing if a piece of work should be managed as a project, as well as what the potential project's initial complexity, risk, and size are. The assessment is used to forecast the amount and level of planning and controls needed for a project, the expertise of the staff required, and the level of senior management involvement. It helps determine when a large or very risky project should be scoped and chartered to deliver one phase at a time. These techniques are used very early in the project with very limited data and the results are used to charter the project.

1. **Expert Judgment.** Expertise on assessing a project may be provided by a group or individual with specialized knowledge in project management. The expert(s) must be able to, with limited information, judge the complexities of a potential project and

make a solid recommendation of the amount and level of planning and controls needed for the potential project. A project may use expert consulting in lieu of a complexity assessment as long as the expert(s) is/are recognized by the organization as such.

2. **Business and Technical Complexity Assessment.** A simple assessment of both the business complexity and the technical complexity of a potential project. It is designed to take an individual or group 15 minutes to complete. It is an exercise that has the participant rate 7-8 business complexity attributes and technical complexity attributes on a scale from one to five.

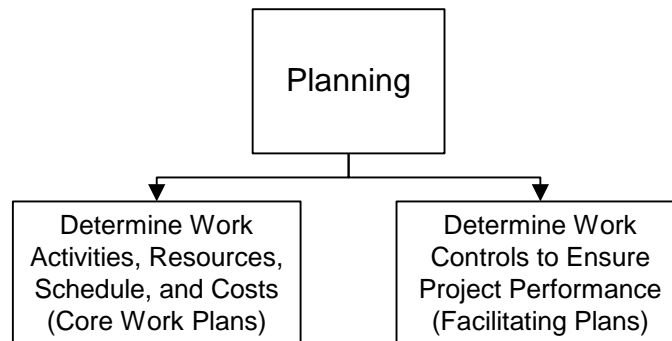
Once the ratings have been determined, a trend can be obtained for both the business complexity and technical complexity.

2.0 PLANNING

Purpose Devising and maintaining a workable scheme to accomplish the business need that the project was undertaken to address.

Overview During this process a project or phase of a project is planned. The amount of planning performed should be commensurate with the scope and the usefulness of the information developed.

The planning process is two fold. It involves developing the core work plans – work activities, business transition management, resources, sequencing, and timing, while at the same time developing plans to control the project or phase. Collectively, the plans represent what is required to create the solution and manage all aspects of the work. Depending on the business need, the technical complexity, and who must be involved, a project or phase may require more, or possibly fewer plans to manage and control the work execution. The business and technical complexity assessment in the Initiating phase gives guidelines to determine how much planning is recommended.



The project plan development takes the results of the planning process activities and puts them into an integrated, consistent, and coherent document to ensure that all of the various elements of the work and business transition efforts are properly coordinated. The planning activities may include as an example developing the work activities, schedule, budget, communications, quality assurance, training, business transition management, and contracting plans. (refer to the DEPARTMENTAL-Office of Contracts & Procurement Contract Process for additional information). The results of these activities are collected into an *Integrated Project Plan*.

An *Integrated Project Plan* is a document or collection of documents that should be expected to change over time as more information becomes available about the project.

Objectives

- To create an initial plan that is focused upon the agreed scope, objectives and problems that the project must resolve.
- To obtain a common understanding and agreement of the work and resources required to creating a solution and managing all aspects of the phase or project including product delivery and business acceptance.
- To collectively obtain commitment from the sponsor, project manager, project team, and other affected groups as to how the work activities, roles and responsibilities, and administrative aspects of the project are to be assigned and performed.
- To reiteratively update the project plan as changes occur on the project and as new information becomes available.

Planning Lessons

Common lessons learned from skipping or poorly executing the planning phase are:

- Project strays from its original goals.
- Late discovery that there are inadequate resources (funds, staff, facilities, or tools) to deliver the expected product or service.
- Resources are over-committed on the project or on other projects.
- Lengthy, repetitive, and large meetings to discuss what needs to be done and how to coordinate.
- Difficulty obtaining and coordinating resources when they are needed.
- Business, technical team, and consumer frustration caused by poorly defined, communicated, and coordinated work activities.
- Issues are not well understood and decisions are repetitively re-opened or re-addressed.

Input to Planning

1. **Project Charter.** The Project Charter is discussed in 1.0 Initiating. However, the importance of the Project Charter is that it contains the agreed upon level of planning required for the project. It should indicate the level of formality required for each of the plans discussed later in this section.
2. **Historical Information.** The available historical information (e.g., estimating data, lessons learned, activities required on previous, similar projects) should be considered when defining, estimating and planning the project.
3. **Organizational Policies.** Any and all of the organizations involved in the project may have formal or informal policies

whose effects must be considered. Organizational policies which typically must be considered include, but are not limited to:

- Quality Assurance Review by a third party on projects over \$1,000,000.00. (1 Million US Dollars) is recommended.
- Financial Controls – time reporting, expenditure and disbursement reviews, accounting codes, standard contract and procurement provisions.
- Decision and Authority Policies – Policies of the state, the organization, and internal to the organization. These policies indicate who has authority over what decisions are made in regard to the project.

Constraints. The constraints are discussed in 1.0 Initiating.

Assumptions. The assumptions are discussed in 1.0 Initiating.

**Planning -
Process
Activities**

The process is a course of proven actions used to guide the organization through the planning phase. Performing these activities has been proven to reduce the amount of risk and rework in later phases of a project.

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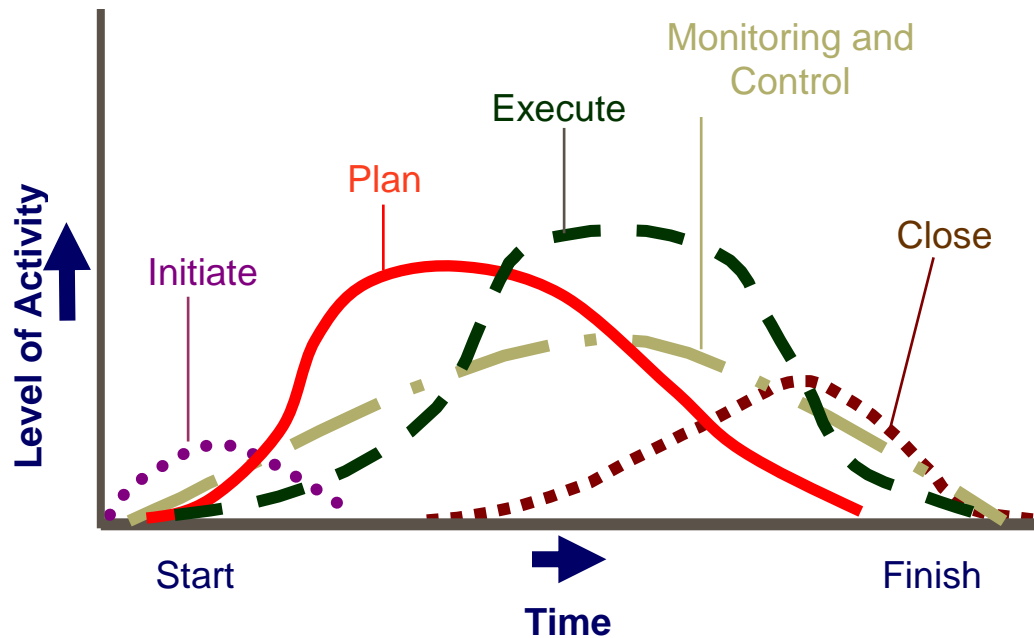
The processes are intended to obtain a common understanding and agreement. Writing the information down informally (white board, e-mail, notes) facilitates the evolution of a common understanding and agreement. The written information serves as a communication vehicle to the project team and *stakeholders*.

Once broad understanding is obtained, formulating an accurate, concise, and readable deliverable from the information is appropriate. Using a deliverable template provides an organizationally consistent method to document project information.

**Remember -
The planning
process
overlaps other
processes**

It is important to remember that a broad or preliminary plan may be all that is needed or feasible at the time to get started with some of the execution work. Remember the planning process overlaps the other processes as depicted below. Many times it is necessary to do some of the execution work, (i.e. requirements, analysis, and sometimes design) before a more definitive plan can be put in place. The planning is accomplished over the course of the project by progressively detailing the work to be accomplished as each major milestone is reached.

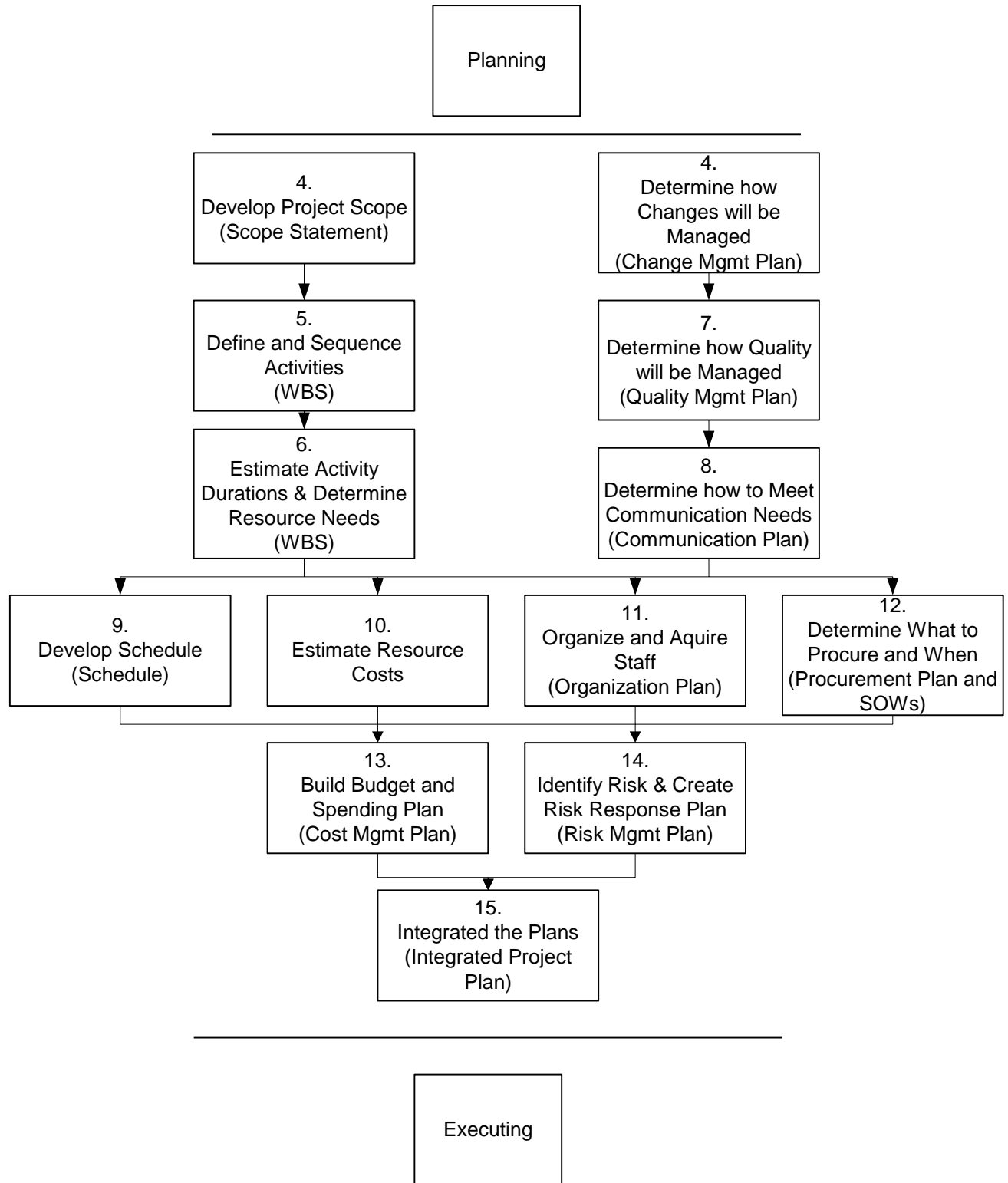
This approach is highly recommended when working with staff and customers who have low tolerance levels in seeing work begin on the product.



**Planning
Process
Activities
Diagram**

The process activities are diagrammed then followed by brief description of each activity. The diagram is numbered to correspond to the “Project Management – Overview Reference” located in the Introduction of this process guide.

The description follows the diagram and each process step is numbered. A title is indicated in bold in the left-hand column. In addition to the title, the recommended template to document the outcomes of the process step is indicated in parentheses. In some cases the process step outcome is recorded in a section of the “Integrated Project Plan” template. In other cases the outcomes are recorded in a separate planning template, i.e. “Communication Plan”.



4. Develop Project Scope

(Integrated Project Plan)

Developing the *Project Scope* includes performing those activities required to ensure that the project includes all the work required, and only the work required, to complete the project successfully. This the work to develop the product and the business transition processes to ensure that the customer is ready to accept the delivered product and the end of the project.

A written scope statement is the basis for future project decisions. It documents the agreement between the project team and the project customer by making known what is and is not to be part of the project. Then the scope statement includes primary objectives, major deliverable milestones, assumptions, constraints and completion criteria. These will be the criteria used to determine if the project or phase has been completed successfully.

Determine How Changes will be Managed

(Integrated Project Plan and Optionally Formal Change Management Plan)

If all the elements of the scope statement are already available (e.g. a product description may identify the major deliverables, the project charter may define objectives) this activity may involve little more than physically copying the information into the integrated project plan document.

During the development of the scope statement decisions must be made as to how the project will manage project and product scope or requirement changes. Product scope changes are changes that impact the agreed upon primary objectives and/or major product deliverables. How product and project scope changes will be managed is the basis of the change management plan for the project. The change management plan may be formal or informal. However it is completed it is a subsidiary element of the “Integrated Project Plan” and at a minimum should include an assessment of the expected stability of the scope (i.e., how likely is it to change, how frequently, and by how much). The plan typically includes agreements to a) evaluate changes to determine if they are beneficial, b) determine that a scope change has occurred, and c) manage the actual changes when and if they occur.

The process and tools described in the Project Change Management Plan is the projects Change Control System. For some projects, a very rigorous change control system may be referred to as either configuration management or requirements management. Requirements Management should be used if the project risk requires a documented procedure to apply technical and administrative direction and surveillance to:

- Identify and document the functional and physical

characteristics of an item or system.

- Control any changes to such characteristics.
- Record and report the change and its implementation status.
- Audit the items and system to verify conformance to requirements.

5. Define and Sequence Activities

Defining the project's work activities is done by subdividing the major deliverables (as identified in the scope statement) into smaller, more manageable components in order to:

(Integrated Project Plan – WBS)

- Improve the accuracy of cost, time, and resource estimates.
- Define a baseline for performance measurement and control.
- Facilitate clear responsibility assignment.

These activities should represent the major deliverables and should include all work activities including the project management work activities and work activities that are the result of the other project plans, i.e. the Quality Management Plan.

The decomposition of the major deliverable into work activities and then tasks is referred to as the *Work Breakdown Structure*.

There are many methods to develop the work breakdown structure. Please see "WBS Development Techniques" in the "Tools and Techniques" section. This reference points you to the various standard lifecycle models available.

Determining the critical work dependencies sequences these work activities in order to support later development of a realistic and achievable schedule. Initial assignment of the critical dependencies can be done in the Integrated Project Plan Template, WBS section. More complex projects will need to use a scheduling tool to create a *Project Network Diagram*.

Many projects attempt to define and sequence the activities at the same time they are building the project schedule. Attempting to build a schedule before activities have been defined and sequenced has been repeatedly proven to lengthen the time it takes to develop an accurate schedule.

6. Estimate

At this point an initial estimate of the likely duration of each of the

Activity Durations and Determine Resource Needs

defined activities is obtained, ideally, from a person or couple of people who are most familiar with the nature of work activity. The duration estimate does not take into account the number of people expected to perform the activity or task.

(Integrated Project Plan)

Often it is difficult to find someone who is willing to or has the expertise to do the duration estimate. Under this scenario, a couple people involved with the planning need to make a duration estimate using their best judgement.

Additional refinement of the estimate is done during schedule development.

7. Determine How Quality will be Managed

Quality Planning involves identifying which quality standards and/or metrics are relevant to the project and determining how to satisfy them. Quality standards should address both product quality and process quality. Ideally the Quality Management Plan must address how quality assurance and control for the project will be conducted. The goal is to plan quality into the project as opposed to auditing quality into the project.

(Integrated Project Plan and optionally Formal Quality Management Plan)

Quality Assurance identifies the activities or tasks that must be performed in the project to provide confidence that the project will satisfy the relevant quality standards.

Quality Control involves monitoring both the products and process to determine if the project is meeting the quality standards as well as identifying ways to eliminate causes of unsatisfactory results.

On projects where the total cost of the project is expected to exceed \$1,000,000 a third party is expected to perform the Quality Management Activities. Typically they would work with the project management team and the Department of Administrative Services QA Analyst to create the Quality Management Plan, determine the appropriate quality assurance activities and activity estimates, and conduct the Quality Assurance.

8. Determine How to Meet the Communication Needs

Communication Planning involves determining the information and communication needs of the *stakeholders*: who needs what information, who will give it to them, how will it be given, and when. The detail of the Communication Plan will vary widely from project to project and should be based on what is suitable communication to enable project and business transition success. A formal Communication Plan covers not only who needs what information, when will they need it, how will it be given to them, and by whom, but also:

(Integrated Project Plan and optionally Formal Communication-

- A collection and filing structure which details what methods will

tion Plan)

be used to gather, store, update, and disseminate various types of information.

- A distribution structure that details to whom information (status reports, data, schedule, documentation, news) will flow and what methods/media will be used to distribute them.
- The method for closing the project and filing or archiving the project or phase information.
- The method for how the communication plan will be updated over the course of the project.

9. Develop Schedule

(Integrated Project Plan and Optionally Scheduling Tool)

Schedule Development means determining start and finish dates for the project activities defined and allocation of the resources to these activities. This process is iterated as the other planning process steps provide the inputs (especially activity definition, duration estimating, resources requirements, and cost estimating) prior to final determination of the project schedule.

Developing the schedule can be done informally in a table or spreadsheet when the number of activities is approximately 20, relationships are not complex, and analysis of critical path is fairly simple to manually assess.

For moderate to complex projects a scheduling tool is highly recommended to do the critical path analysis and resource allocation. The tool typically combines critical path analysis and resource leveling based on the project calendar to establish the start and end dates for each activity.

Currently the department is using Microsoft Project as the scheduling tool and a basic project template is available on the PMO Web site under templates/planning.

Inputs to schedule development include the WBS containing the activity definitions, duration estimate; resource needs and in more complex projects a *Project Network Diagram*, which indicates the projects work activity relationships in a diagram.

Other things to consider are the normal or irregular work hours under which the project will be scheduled. What will the project calendar be? Will it be Monday through Friday 8-5, with holidays and vacations exempted? Or will shift hours and weekends be open to scheduling the work activities.

Other considerations are constraints, such as imposed dates for completion of certain deliverables and key events or major

milestones that cannot be moved without great difficulty.

10. Estimate Resource Costs

(Integrated Project Plan and Cost Estimate Spreadsheet and/or Scheduling Tool)

Estimating resource costs involves developing an approximation (estimate) of the costs of the resources needed to complete the project activities. The question to be answered is “how much will it cost the organization to provide the product or service involved?”

Cost estimating involves identifying and considering various cost alternatives. For example, will more work during the design phase reduce the cost of the construction phase?

Costs should be estimated for all resources to be used on the project. This includes all internal and external labor, materials, supplies, contracts, and special costs not normally a consideration (i.e. facility costs, legal costs, team training costs).

Cost estimates should be expressed in dollars. This may require that costs estimated in hours be converted using a calculation to dollar costs. Generally, the calculation for internal staff is average project staff salary + (average project staff salary * 80% fringe and benefits). If this estimate is required care should be taken not to mix internal labor hours with external labor hours or other costs. This will allow flexibility to show the cost figures with and without internal labor hours for some of the *stakeholders*.

Finally, cost estimates are refined during the course of the project to reflect the additional detail available as the project progresses. The cost estimates should be definitive just prior to construction.

There are three cost estimating techniques available for estimating.

11. Organize and Acquire Staff

(Integrated Project Plan and Setup Project Files)

Organizing the project includes identifying, documenting, and assigning project roles and responsibilities as they relate to the work defined, as well as acquiring the staff and setting up the electronic and or hardcopy project files and supporting procedures.

Role and responsibility assignments may require developing a Responsibility Assignment Matrix (RAM) and/or a project organization chart with descriptions of each of the roles. The purpose of developing these is to get a common understanding of their responsibilities for those assigned to the project.

Staff acquisition may require negotiations with the responsible functional managers for the appropriate resources or negotiations with other project managers where resources will be shared. In some cases, internal staff may be pre-assigned; in others the project procurement process can be used to obtain specific staff.

How the project will manage project documentation should be determined. A standard electronic project library structure is strongly recommended for storing the various project information. In many cases a hardcopy version of the final draft is also maintained.

**12. Determine
What to
Procure and
When**

**(Integrated
Project Plan
and Optionally
Formal
Procurement
Plan & SOWs)**

Procurement planning identifies which project needs can be best met by procuring products or services outside the project organization. The questions to be answered are whether or not to procure, how to procure, what to procure, how much to procure, and when to procure it. A procurement plan communicates how all the procurements/contracts will be managed solicitation planning, solicitation, and source selection, to contract administration and contract closeout. The plan may be formal or informal, highly detailed or broadly framed, and/or based on the needs of the project and/or organization.

In addition to the procurement plan, the procurement documents must be prepared. The Statement(s) of Work (SOW) required should be developed in sufficient detail to allow a prospective vendor to determine if they are capable of providing the item. SOWs generally fall into two categories, one for contracting for a specifically described product or service, and the other for presenting a problem that is to be solved. Sometimes the second type of SOW may be called a Statement of Requirements.

Other procurement documents that may be needed are the Invitation to Bid (IFB), Request for Proposal (RFP), Request for Quotation (RFQ), and Evaluation Criteria to rate or score the proposals. Generally, evaluation criteria include:

- Understanding of the Need – as demonstrated by the vendor’s proposal.
- Overall Cost – Will the vendor’s solution produce the lowest total cost for implementation and ability to maintain or operate?
- Technical Capability – Does the vendor have or has proven ability to acquire the technical skills and knowledge needed?
- Management approach – Does the vendor have or be reasonably expected to use internal management processes to ensure a successful project?
- Financial Capacity – Does the vendor have, or can they be reasonably expected to obtain, the financial resources needed?

As a final note, these steps are all part of procurement planning for the project; the actual solicitation process is part of the execution phase. How early solicitation is performed in the execution phase is determined by the initial project plan that is coordinating all project work activities to be executed, including solicitation work activities.

13. Build Budget and Spending Plan

(Integrated Project Plan and Optionally Formal Cost Management Plan and/or scheduling tool)

Most projects will develop some level of budget information and some will also develop a spending plan. Project budgeting involves assigning all the cost estimates to individual work activities or tasks on the project schedule to establish a cost baseline. By assigning the estimates to the schedule a time-phased budget or spending plan can be created to show budget by month. For example, by allocating to the major categories in the cost estimating step:

- All internal labor – Internal staff within The Department.
- All external labor – Staff external to the Department, but not contracted.
- Materials and Supplies.
- Contracts – All contract costs including contracted staff.
- Special Costs—Those not normally a consideration (i.e. facility costs, legal costs, or team training costs).

A budget by month and by cost category can be established and utilized later to track actual cost against planned costs.

14. Identify Risk & Create Risk Response Plan

(Integrated Project Plan and Optionally Risk Management Plan)

Risk planning involves determining and defining:

- Which risks are likely to affect the project,
- Evaluating the risks to assess range of possible outcomes, and
- How the risks will be mediated if they occur or defining how the planned work activities will be modified and at what cost to avoid selected risks from occurring.

Common sources of risk include:

- Insufficient business transition planning.
- Changes in requirements
- Design errors, omissions, and misunderstandings.

- Poorly defined or understood roles and responsibilities.
- Poor estimates or unsupported estimates.
- Insufficiently skilled staff.
- Impossible time frames.

15. Integrate the Plans

(Integrated Project Plan)

Integrating the Project's Plans uses the outputs of the previous steps re-iteratively to create a consistent, coherent document that can be used to guide both project execution and project control. This step maybe iterated several times, for example the initial draft may include generic resources and undated durations while the final plan reflects specific resources and explicit dates. The Integrated project plan is used to:

- Guide project execution.
- Guide business acceptance and preparation.
- Document project planning assumptions and decision regarding work alternatives chosen.
- Facilitate communication among *stakeholders*.
- Provide the *baseline* information for progress or performance measurement and project control.

The Integrated Project Plan is a document or collection of documents that should be expected to change over time, as more information becomes available to the project. The baselines are controls that will, in general, change only intermittently and then usually only in response to an approved scope change.

Output From Planning

1. **Integrated Project Plan** – as defined is step 15 of this chapter.
2. **Updated Project Charter** - The Project Charter is discussed in 1.0 Initiating. However, the Project Charter is likely to have been updated with additional commitments on staff, plans, and controls during the planning process.
3. **Supporting Detail** –
 - Outputs from other planning processes that are not included or referenced in the integrated project plan.
 - Additional information or documentation generated during

development of the project plan (e.g. constraints and assumptions that were not previously known).

- Technical documentation; such as, a history of all research, assessments, requirements, designs.
- Documentation of relevant standards

Tools and Techniques

Project Planning Methodology

WBS Development Techniques

Estimating Techniques

3.0 EXECUTING

Purpose Coordinating people and other resources to carry out the plan.

Overview The execution phase is the primary process for carrying out the Project Plan; the vast majority of the project budget will be expended in performing this phase. In this phase the project management team uses the Integrated Project Plan to coordinate and direct the various technical and organizational aspects of the project. It is this phase that is most directly affected by *Product Oriented Processes* in that the product of the project is actually created here.

Product Oriented Processes are concerned with specifying and creating the project product. In the IT industry they are referred to as the Development Lifecycle Processes (see Executing section, PMO Templates). The lifecycle processes define the work activity to build the product or service. It is important to note that the processes, objectives, lessons defined here describe the executing work activities of the project manager, and or project's administrative personnel (procurement coordinator, communications analyst, scheduler, QA analyst) in coordinating the people and other resources to carry out the plan. They are not the processes, objectives, lessons of the product lifecycle processes.

It is in this phase that the project manager actually coordinates the staged work activities previously defined in the planning process. The planning process tailored and incorporated the appropriate lifecycle model (based on type of product) into the integrated project plan's work breakdown structure.

The project management team, to ensure the carrying out of the project plan, uses execution processes. These processes include plan execution and work activities to evaluate project performance, develop team skills, provide adequate project communications, and if necessary solicit, select, and manage contracts. The key general management skills needed for successful project execution are - leading, communicating, negotiating, problem solving, and influencing.

- Objectives**
- To ensure that the project's products are created as agreed.
 - To use the integrated project plan to coordinate the work activities and planned agreements represented therein.
 - To provide confidence to the key *stakeholders* that the project's

product and process meet the various agreed quality standards.

- To improve project performance by enhancing the ability of *stakeholders* to contribute as individuals and enhancing the ability of the group of individuals to function as a team.
- To provide needed information to project *stakeholders* in a timely manner – including responding to unexpected requests for information.
- To obtain vendor solicitations, manage the source selection, and administer the contract and relationship with the vendor.

Executing Lessons

Common lessons learned from skipping or poorly performing the executing phase are:

- Agreements and commitments in the integrated plan are not held or not followed through causing frustration, accusations, distrust, varying results, poor quality, work slippage, and sporadic work activity.
- Quality in process or product is not taken seriously by all or is sacrificed for any number of reasons, i.e. removing test work to stay on schedule.
- Team Moral is low – distrust of team members and managers' skills, finger pointing and blaming, predominately negative and sarcastic. Decisions being made based on whose side is taken, versus facts, logic, and collaboration.
- Work performance is low or insufficient due to lack of needed skills on the project.
- *Stakeholders* lose interest or *stakeholders* unknowingly sabotage the project due to lack of information.
- Vendor deliverables are late or don't meet contract expectations. The project or vendors are not performing their roles/tasks as agreed in the contract.
- The project is unsure what vendor services it paid for and which it has not. The project and the vendor are knowingly or unknowingly - not adhering to the contract.

Input to Executing

1. **Integrated Project Plan.** The integrated project plan is described in section 2.0 Planning. The integrated project plan may reference subsidiary plans (requirements management,

change management, risk management, procurement management, etc) and the performance measurement baselines are key inputs to project plan execution.

2. Supporting Detail.

- Outputs from other planning processes that are not included or referenced in the integrated project plan.
- Additional information or documentation generated during development of the project plan (e.g. constraints and assumptions that were not previously known).
- Technical documentation; such as, a history of all research, assessments, requirements, designs.
- Documentation of relevant standards

3. Organizational Policies. Any and all of the organizations involved in the project may have formal and informal policies that may affect project plan execution.

4. Preventive action. Preventive action is anything that reduces the probability of potential consequences of project risk events.

5. Corrective Action. Corrective action is anything done to bring expected future project performance in line with the project plan. Corrective action is an output of the various control processes- as an input here it completes the feedback loop.

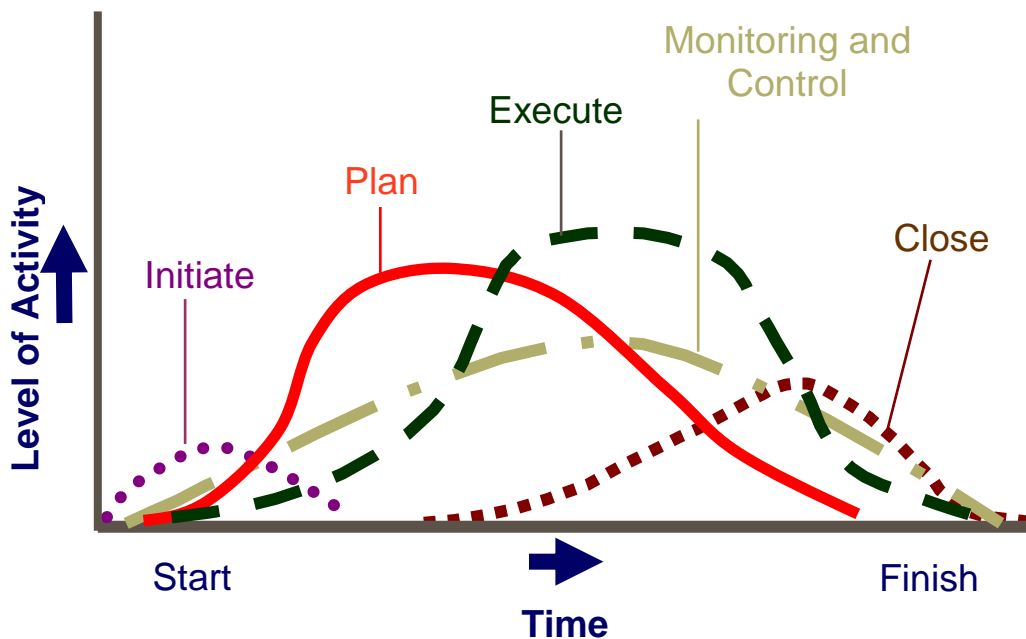
**Executing -
Process
Activities**

The process is a course of proven actions used to guide the organization through project plan execution. Performing these activities has been proven to reduce the amount of risk and rework in the project.

**Remember -
The executing
process
overlaps with
other
processes**

Typically during the initial stage of execution the amount of work activity and staff is low. Generally the project is working from a preliminary plan to execute some initial work activities such as research, assessment, requirements, etc., to obtain more information about the project and to complete additional planning. Remember the execution process overlaps the other processes (primarily planning and control) as depicted below. Many times it is necessary to do some of the execution work, (i.e. research, assessment, requirements, analysis) before a more definitive plan can be put in place for work execution. As a more definitive plan is completed the momentum and amount of resources and work activities increase.

This approach of working from a preliminary plan to do the initial and less risky work execution tasks is highly recommended when working with staff and customers who have low tolerance levels in seeing work begin on the product.

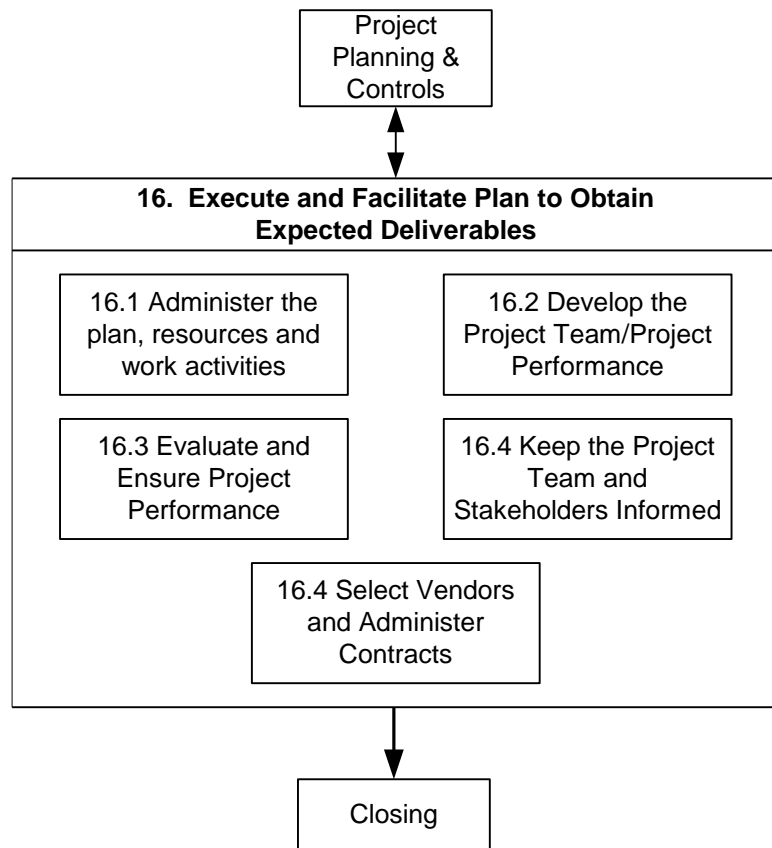


**Executing
Process
Activities
Diagram**

The project management process activities are diagramed then followed by brief description of each activity. The diagram is numbered to correspond to the “Project Management – Overview Reference” located in the Introduction of this process guide. The overview represents execution as a single project management step (#16) because most of the project management execution work is not serial. However, for reading purposes we have broken this single step into a number of sub steps.

A description of the project management sub steps follows the diagram. A sub step title is indicated in bold in the left-hand column.

The actual work activity to be executed by the technical team is defined in the integrated project plan’s work breakdown structure (WBS). The standard development lifecycle models for WBS’s can be found in the executing templates section of this guide.



16. Execute Project Plan Activities

This process step has several sub steps that are worked together to continuously manage and coordinate the work activities, resources, information needs, contracts, quality, and team development. Keep in mind that the project execution process does overlap project planning and control processes – meaning that during the period of time on the project that the plan is being executed, the project management team is also performing more or reiterative project planning and control activities. So at the same time that the products of the project are being built and implemented – many project management process activities are occurring to ensure the project's success.

16.1 Administer the plan, resources and work activities

The project manager must ensure that the project achieves the agreed results, outcomes and deliverables as defined in the project's integrated project plan. To administer the plan, resources and work activities the project manager must lead, communicate, negotiate, problem solve and influence everyday.

Working from the project plan the project manager keeps the work moving forward by focusing the team on the near term work assignments and expectations. Some project managers have Monday morning meetings, others meet daily to ensure that everyone knows the current work assignments, to resolve minor issues, to ensure coordinated work efforts, and determine how to clear the way of current obstacles.

In addition the project manager may have one-on-one meetings with various project team members or other *stakeholders* to confirm assignments, resolve problems, negotiate solutions.

The primary goal is to facilitate the project's processes as defined in the Integrated Project Plan. Often it is easy for the project to stray from the plan based on the issue of the day, unsettling news, procrastination, relationship conflicts, pointless dialogues, or preference to get to a specific piece of work. The project manager must effectively build and nurture team values to stay on schedule. The team must understand the importance of staying on and managing to the schedule because of its importance to the customer and the organization. However, this is not an excuse for the project manager to micro-manage or use other types of harassing tactics to stay on schedule. Following written processes and using soft skills to influence outcomes has proven to get better results. Authority tactics should be used with caution and in extreme cases, not as an everyday occurrence.

To be developed - See Planning and Conducting Meetings in the

Tools and Techniques Section.

**16.2
Develop the
Project
Team/Project
Performance**

Team development includes both enhancing the ability of the *stakeholders* to contribute as individuals as well as enhancing the ability of the team to function as a team. Individual development (managerial and technical) is the foundation necessary to develop the team. Development as a team is critical to the project's ability to meet its objectives. Team development comes throughout the life of a project. Tools and Techniques that can assist include formal and informal team building activities, team training, reward and recognition, and collocating teams.

However, before applying any team building techniques it is critical to understand "what" stage of development the team is at to determine "what" team development is needed to increase the team performance. Applying team development tools without a purpose or goal and without understanding of team development stages is often counter-productive and frustrating for the whole team.

To be developed - See (Team Development Stages and Guidelines) in the Tools and Techniques Section.

Team performance improvements can come from many sources and can affect many areas of project performance; for example:

- Improvements in an individual's skills (gained through training or mentoring) may allow a specific person to perform assigned activities more effectively.
- Improvements in team behaviors (e.g. surfacing and dealing with conflict) may allow project team members to devote a greater percentage of their efforts to technical activities.
- Improvements in either individual or team competencies may facilitate identifying and developing better ways of doing project work.

**16.3
Evaluate and
Ensure Project
Performance
(QA Status and
Improvement
Report)**

The quality assurance activities to be performed on a project are identified and agreed to during Quality Planning. These planned activities are conducted during project execution to provide confidence to the project management team, organizational management, customer and others that the project is satisfying the planned process and product quality standards.

A person or group outside of the project typically performs quality assurance activities. Formally this may be a contracted QA specialist, or an internal QA specialist. Informally this may be

another project manager or technical expert who is outside the project and that have been asked to perform some quality assurance activities.

The Quality Assurance role should provide overall quality consultation, periodically examine Quality Control Reviews results, checklists, change requests and tracking and summarize the results for executive review and oversight throughout the life of the project. This summary, whether produced by a Quality Assurance Reviewer internal or external to the organization, must be created using the “QA Status Improvement Report”.

The summary report includes information such as overall project risk rank, definition of high risks uncovered, and recommendations for resolution and/or quality improvements.

Quality improvement includes taking action to increase the effectiveness and efficiency of the project to provide added benefits to the project *stakeholders* – in most cases implementing quality improvements should be carried out through change control.

**16.4
Keep the
Stakeholders
Informed**

Some experts have rated communications to be, as high as, 70-90% of the project managers job during project execution. The project manager, throughout the day, is making needed information available to project stakeholders in a timely manner. This takes a considerable amount of the project’s time and skill sets because stakeholders may include end users, business partners, customers, regulatory groups, suppliers, technology support, policy developers, technical developers, producers, testers, maintainers, and external parties.

Inexperienced project managers often make the mistake of shying away from the communications role, and focus on the technical skill of project management or the product.

During project execution the project manager formally manages the communication plan, which indicates who the stakeholders are, what type of information is needed for the project, in what formats, at what frequency, and who is responsible for delivering the communications.

Ideally the communication plan identifies the need for both informal and formal communication. Unfortunately the normal situation is a communication plan that focuses on formal communications for customer stakeholders only. In this case, the informal communications are dealt with daily on a case-by-case basis – responding and reacting to unexpected requests for information.

This often eats up a great deal of the project manager's time, as well as, many other project staff. Lack of an informal communication plan leads to complaints about the project not communicating internally with the various impacted groups.

The typical written communications that occur during project execution and are distributed to differing stakeholders are:

Project records, deliverable documents, internal and external correspondence and memos, email, procurement documents and records, accounting records, personnel records, roles and responsibilities, time tracking records, change and issues decisions records, presentations, publications, status reports. This information should, to the extent possible and appropriate, be maintained in an organized fashion.

The typical verbal communication that occur during project execution are:

Work direction, negotiation, clarifications, conflict resolution, encouragement, answering questions, advice, opinion, decisions, progress or status, and relaying communication from others. The successes of these types of communications are highly dependent on the project manager's personal verbal and behavioral communication skills. Often these types of soft skills are more critical than the technical skills of project management, yet they are often over looked in project management training, and the project manager does not take the time to improve these skill sets.

Bottom-line is, the project's written and verbal communications internally and externally with all stakeholders often makes the critical difference between a successful and non-successful project.

16.5 Select Vendors and Administer Contracts

A common mistake made on projects is the idea that solicitation and vendor selection is part of project planning or worse yet done before a project is initiated. Part of the confusion lies in the fact that project planning is intended to overlap the early project execution work activities, therefore it seems unclear whether solicitation and selection are planning or executing activities.

During project execution the project obtains solicitations from prospective sellers, i.e. quotations, bids, offers, or proposals, as appropriate. The project evaluates the proposals based on the defined evaluation criteria given in the Request for Proposal (RFP). The result of the evaluation process is the selection of a seller. Then the project will work with the contracts unit to negotiate and sign a contract. Once a contract is in place the project begins the

execution of contract administration.

Contract administration focuses on managing the relationship with the seller. Contract administration is the work activities that ensure the seller's performance meets contractual requirements. On larger projects with multiple products and service providers, a key aspect of contract administration is managing the interfaces among the various providers. The legal nature of the contractual relationship makes it imperative that the project team be acutely aware of the legal implications of actions taken when administering the contract.

Projects with a single simple contract may not need a formal Contract and Procurement Plan. The Contract and Procurement Management Plan defines the procurement processes, responsibilities, and how contracts are to be administered for project execution.

Projects with contracts must make sure that they are formally documenting and filing the outcomes of all the contract and procurement process activities. Many organizations require the use of the standard directory structure for filing electronic records and recommends a similar format for hardcopy record.

Output from Executing

1. **Work Results** – Work results are the outcomes of the activities performed to accomplish the project. Information on work results – which deliverables have been completed and which have not, to what extent quality standards are being met, what costs have been incurred or committed, etc. – is collected as part of project plan execution and fed into the performance reporting process. It should be noted that although outcomes are frequently tangible deliverables such as buildings, roads, etc., they are also often intangibles such as people trained that can effectively apply that training.
2. **Change Requests** – Change requests (e.g. to expand or contract project scope, to modify cost (budgets), or schedule estimates (dates, etc.) are often identified while the work of the project is being done.

Tools and Techniques

1. **General Management Skills** – such as leadership, communicating, and negotiating are essential to effect project plan execution.
2. **Product Skills and Knowledge.** The project team must have access to an appropriate set of skills and knowledge about the project's product. The necessary skills are defined as part of

planning - see either the Integrated Project Plan Template or the Training Plan Template,.

3. **Work authorization system.** A formal procedure for sanctioning project work to ensure that work is done at the right time and in the proper sequence. The primary mechanism is typically a written authorization to begin work on a specific activity or work package. The design of a work authorization system should balance the value of the control provided with the cost of that control. For example, on many smaller projects, verbal authorizations will be adequate.
4. **Status Review Meetings.** Status review meetings are regularly scheduled meetings held to exchange information about the project. On most projects, status review meetings will be held at various frequencies and on different levels (e.g. the project management team may meet weekly by itself and monthly with the customer or other *stakeholders*).
5. **Project Management Information System (PMIS).** A PMIS is used to gather, integrate, and disseminate the outputs of the project management processes. It is used to support all aspects of the project from initiating through closing, and can include both manual and automated systems.
6. **Organization Procedures.** Any and all of the organizations involved in the project may have formal and informal procedures that are useful and/or required during project execution.

4.0 CONTROLLING

This section is partially completed.

Purpose	To ensure the project objectives are met by monitoring and measuring progress and when necessary, taking corrective action.
Overview	The appropriate project controls are selected in the initiating phase,

defined in the planning phase, and used during the executing phase to ensure project performance. The plans for a project's controls are adapted during planning to be commensurate with the project type, size and risk. For this reason the control plans include the adapted process, techniques, and tools that the project has agreed to use.

As the project proceeds, the responsibility of the project team is to review progress against the milestones and goals defined in the integrated project plan. The project control activities manage, track and provide visibility of actual progress. Most project controls consist of tracking, reviewing and managing activities. Some typical project controls are the tracking and management of:

- Costs and Time.
- Issues and Decisions.
- Changes to Scope, Schedule, or Contract.
- Status and Communications.
- Quality and Risk Response.

Additional templates are being developed to control the business transition efforts as they relate to the development of the product and the organizations readiness to receive the product.

The planned controls are used as the basis for tracking and managing the project activities, communicating status, and if appropriate, revising plans. Progress is primarily determined by comparing the scope, effort, cost, and schedule to the plan when selected work products are completed or at selected milestones. When it is determined that the project's plans are not being met, the project management team should determine the best course of action. This may include revising the integrated project plan to reflect the actual accomplishments and re-planning the remaining work or taking actions to improve the performance.

Objectives

- To understand the benefits of change and ensure coordination of the impact to the adjusted scope, requirements, schedule, cost, quality and risk.
- To maintain a common understanding and agreement of the scope, work, schedule, resources required and decisions made.
- To ensure business readiness to receive the product once the

project has completed

- To ensure that the project has achieved the planned quality results and to correct significant or risky deviations from the quality plan.
- To ensure project commitment and support throughout the life of the project by maintaining regular communications of the project performance.
- To recognize and proactively respond to changes in risk over the course of the project.

Controlling Lessons

Common lessons learned from skipping or poorly executing the controlling processes are:

- As the project progressed the project plans became less and less useful, resulting in increasingly vague commitments to questions on schedule, effort, costs, and what would be delivered.
- The project was being run under the management radar screens in an effort to avoid politics, but failed because they were unable to avoid problems/issues with too many project running at the same time.
- Overtime, the project lacked management understanding, support and commitment.
- Cost occurred from out of nowhere, unexpected people were charging to the project, some people we approved to charge to the project, didn't. Cost and effort overruns couldn't be predicted.
- The project reacted to all issues as they occurred, with equal effort and importance. Risks became unmanageable
- Design changes were done on the fly, repeated, and prone to error.
- Quality in process and in product was random. If extra effort could be fit into the remaining time or if an individual felt compelled to ensure a quality outcome it happened.
- Loss of project team moral due to lack of awareness of changes made, lack of analysis of work impact, and sudden overtime commitments.

Input to Controlling

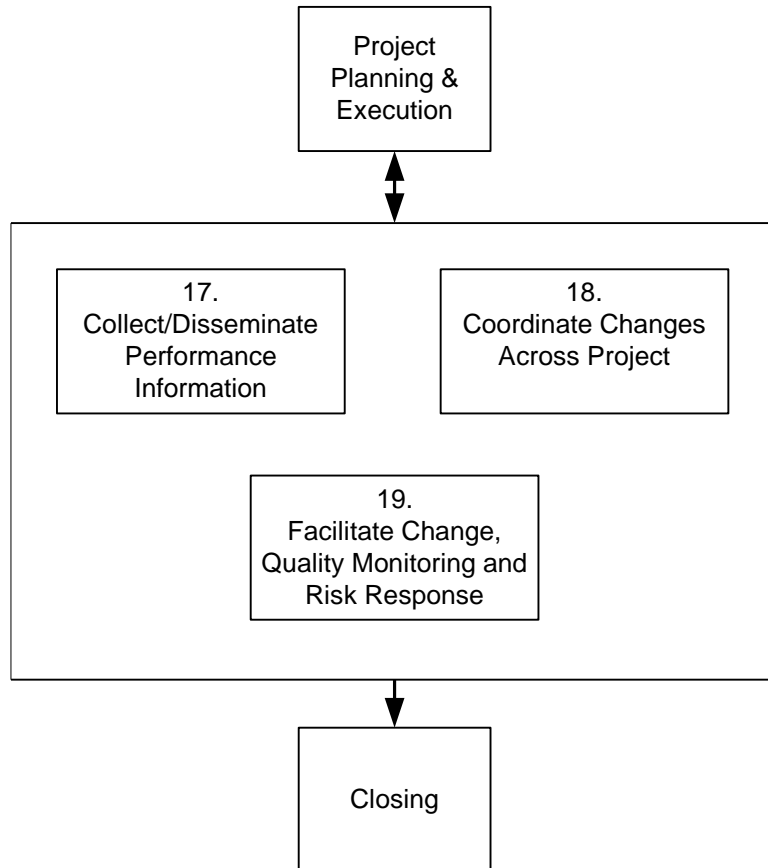
1. **Integrate Project Plan (IPP).** the specific parts of the IPP related to the inputs for Controlling are:
 - **Overall Change Management Plan.** Defines how changes to the project's scope/requirements, costs, schedule, quality, and risks will be coordinated for understanding and possible impact in all of the planned areas. Ensures the ongoing integrity of the project's Integrated Project Plan.
 - **Quality Management Plan.** Addresses how Quality Control will monitor the specific project results to determine if they comply with relevant quality standards and identifies ways to eliminate causes of unsatisfactory performance.
 - **Risk Management Plan.** Addresses how Risk Response Control (mitigation and contingencies) will respond to changes in risk over the course of the project.
 - **Communication Plan.** Addresses the collecting and disseminating of performance information. This may include status reporting, progress measurement and forecasting.
 - **Business Transition Change Management Plan** *<currently not developed>*
2. **Work Results.** Work results are the outcomes of the activities performed to accomplish the project. Information on work results – which deliverables have been completed and which have not, to what extent quality standards are being met, what costs have been incurred or committed, etc. – is collected as part of project execution and fed into the project's performance reporting activities.
3. **Change Requests.** Change requests (e.g. to expand scope, modify costs or schedule estimates, etc.) are often identified while the work of the project is being done in the execution phase.

Process Flow Diagram or Tasks

The process activities are diagramed and then followed by brief description of each activity. The diagram is numbered to correspond to the "Project Management – Overview Reference" located in the introduction of this process guide.

The description follows the diagram and each process step is

numbered. A title for the process step is indicated in bold in the left-hand column. In addition to the title, the recommended template to document the outcomes of the process step is indicated in parentheses.



17. Collect and Disseminate Performance Information
(Status Report)

Performance reporting involves collecting and disseminating performance information in order to provide *stakeholders* with information about how resources are being used to achieve project objectives. How performance reporting is to be carried out for the project is defined in the projects communication plan. Once the project is underway collecting performance information involves collecting and analyzing information about the project (i.e. what deliverables are complete, how much time and dollars have been spent, how much change has occurred, etc). This type of information comes from work results – what deliverables are fully and partially complete, what costs have been incurred or committed, etc, and other project records such as the schedule, change log, issue logs, procurement and contracting log, quality control review recommendations, and training log.

The collected information is disseminated by creating a status

report that includes:

- Describing where the project now stands
- Describing what the project team has accomplished
- Predicting future project status and progress

18. Coordinate Changes Across Project

(Change Request Form, Change Tracking Log, Training Log, Issue Mgmt Log, Comm. Plan Log)

or optional tool see tools and techniques.

Coordinating changes across or overall change control requires:

- Maintaining the integrity of the performance measurement baselines –all approved changes should be reflected in the Integrated Project Plan, but only project scope/requirements changes will affect the performance measurement baselines.
- Ensuring that changes to the product scope are reflected in the definition of the project scope (for differences in type of scope see the glossary definitions).
- Coordinating changes impact throughout the project plans. For example, a proposed schedule change will often affect cost, risk, quality and staffing.

Overall Change Control ensures that the project's Integrated Project Plan remains the most useful, effective and efficient way to accomplish the projects objectives.

The Integrated Project plan provides the baseline against which changes will be controlled.

Project performance information, how the project is doing, alerts the project team to issues that may cause problems in the future. And change requests in various forms, oral or written, direct or indirect, externally or internally initiated, and legally mandated or optional may occur and will need to be managed through the Change Management Plan which has been adapted for the project. These inputs and the change management plan facilitate the projects ability to take appropriate corrective action when real variance occurs and ensures the project plans are coordinated and accurate.

Reasoning behind the corrective actions and changes from change control should be documented for use as lessons learned – becoming part of the historical database for the performing organization.

19. Facilitate Change, Quality Monitoring and

Overall change control deals with evaluating and coordinating changes that may impact some or all of the areas of the project. How the changes are implemented into the specific areas (scope, schedule, cost, risk, etc) is facilitated based on the management

Risk Response plan for each area. For example, did the risk of the project require a risk management plan that describes the project's risk management process, tools and techniques? The more complex the project the higher the need for formal plans which represent agreement on how changes will be determined and implemented. Lower complexity project may use just the overall change management plan and have no need for the more rigorous processes.

The specific areas where project controls may be applied include Scope Change Control, Schedule Control, Cost Control, Quality Control, and Risk Response Control. The following are brief descriptions of these specific controls.

Scope Change Control Scope Change Control – controlling changes to the project and product scope.

(Requirements Traceability Matrix) The WBS, project performance, scope or requirement management plan and change requests help to determine if a change is beneficial, has occurred, or should occur. Changes that typically effect scope are:

or optional tool see tools and techniques.

- An external event (e.g. a change in a government regulation).
- An error or omission in defining the scope of the product (e.g. failure to include a required feature in the design of a system).
- An error in defining the scope of the project (e.g. failure to include work to install new Local Area Network (LAN) lines)
- A value-adding change (e.g. the project is able to reduce cost by taking advantage of technology that was not available when the scope was originally defined).

The Requirements Management Plan should address how a scope change would be facilitated through all levels of scope (e.g. business need, project objectives, high level requirement down to test cases and implementation requirements). Scope changes are fed back through the planning process, technical and planning documents are updated as needed, and *stakeholders* are notified as appropriate. Reasoning behind the corrective actions and changes from scope change control should be documented for use as lessons learned.

Schedule Control Schedule Control – controlling changes to the project schedule.

The procedures by which the project schedule may be changed will

be developed in a future process release.

Cost Control

Cost Control - Controlling changes to the project budget.

**(Contract and
Procurement
Tracking
Spreadsheet,
Budget
Tracking
Spreadsheets)**

Cost control includes:

- Monitoring cost performance to detect variances from plan.
- Ensuring that all appropriate changes are recorded accurately in the cost baseline.
- Preventing incorrect, inappropriate, or unauthorized changes from being included in the cost baseline.
- Informing appropriate *stakeholders* of authorized changes.

The procedures by which the project cost baseline may be changed will be developed in a future process release.

Quality Control

Quality Control – monitoring specific project results to determine if they comply with relevant quality standards and identifying way to eliminate causes of unsatisfactory performance.

**(Quality
Standard
checklists)**

Project results include both product results such as deliverables and management results such as cost and schedule performance.

Inputs to Quality Control include work results, a quality management plan, operation definitions, and checklists. Quality control reviews are conducted according to the plan. This does not mean that the specific result or deliverable that is to be reviewed is always planned. For example, if reviews are scheduled for testing, the specific test cases to be reviewed are not known – they are a random sampling. Staff on the project may conduct some types of quality control reviews. Staff outside the project best conducts other reviews. The quality control reviews include analyzing the results and making recommendations if necessary for improvements. The quality management planning process determines the amount of reviews, and who will perform them as is appropriate for the type, size and risk of the project.

The typical output from conducting quality control reviews includes, quality improvements, acceptance decisions, rework, completed quality control checklists, and process adjustments.

**Risk Response
Control**

Risk Response Control – responding to changes in risk over the course of the project.

**(Risk Mgmt
Log)**

This involves executing the risk management plans in order to respond to risk events over the course of the project. The risk management plan indicates the type of risk response that has been

agreed to in the event that the risk or risk trigger occurs. Some of the identified risks events will occur, others will not. The ones that do are actual risk events, and the project management team must recognize that one has occurred so that the response developed can be implemented.

The planned risk responses generally are a mitigation (lessening of the impact) or contingency (implementing another prepared plan if the risk occurs). However, some risk responses are unplanned workarounds. Workarounds are unplanned responses to negative risk events. They are only considered an unplanned workaround, in the sense that the response was not defined in advance of the risk event occurring.

As anticipated risk events occur or fail to occur, and as actual risk event effects are evaluated the risk management plan and risk log should be updated.

**Business
Transition
Controls**

<insert in here the control process for business transition efforts within a project once those processes have been defined and are made available.>

**Output From
Controlling**

1. **Integrated Project Plan updates.**
2. **Corrective Action.** Approved scope/requirements changes, schedule updates, revised cost estimates, budget updates, estimate at completion, quality improvements, quality acceptance decisions, rework, completed quality checklists, process adjustments, risk response, and updates to plans.
3. **Lessons Learned.** Causes of variances that required a corrective action to the scope, budget, schedule, risk, quality plan, rework – effectively any part of the Integrated Project Plan. Lessons learned filed with the PMO.

**Tools and
Techniques**

Change Management Application – some project have created or reused an access database change management application.

Configuration Management Application – depends on technology, I.e. Merant's PVCS Pro.

Requirements Management Application – Rational's Requisite Pro.

MS Projects – Scheduling and Tracking Tool.

5.0 CLOSING

Purpose

The purpose of this section is to formalize the acceptance of the project or phase and bring it to an orderly end.

Overview

After either achieving its objectives or being terminated for other reasons, the project or phase requires closure. From the beginning the project must know its completion criteria, the difference between a completed or an uncompleted project, to stop a project from dragging on endlessly. (See the project's Product Description and the Integrated Project Plan documents.) Project closing consists of verifying the project's completion criteria have been met, and the Project Evaluation Report and, if necessary, the Project Close-out Transition Checklist (used to roll a project into maintenance and document Lessons Learned) have been compiled and archived into the project archives to retain this information for use on future endeavors. These criteria typically indicate that a project has delivered the specified product, though usually there are several loose ends to wrap-up. Before a project is considered complete and resources are released the project must wrap-up loose ends such as:

- Verifying that all deliverables have in fact been delivered and approved.
- Outstanding issues are assigned for closure.
- Lessons are documented as to what went well (to repeat in the future) and not so well (mistakes to avoid).
- Coordinating with the maintenance manager to ensure maintenance personnel is assigned and familiar with all aspects of the product release.
- Ensure that control over future components (change requests) has passed to the maintenance manager and user support is in place.
- Formalizing acceptance of the product by the sponsor, client, or customer.

Objectives

- To ensure all stakeholders agree the product or service is acceptable by signing a formal written document during the project's phase completion or close-out.
- To ensure the appropriate stakeholders agree the

contractor's product or service is acceptable by signing a formal written document during the project 's phase completion or close-out.

- To complete a comprehensive project evaluation.
- To verify the project's completion criteria, including business transition efforts, were met.
- To recognize project team and celebrate project closure.
- If applicable, to ensure outstanding issues are passed to appropriate personnel with a follow up or maintenance plan.
- To indicate how to roll the project into maintenance or to close the project.
- To document final lessons learned to provide repeatable and avoidable activities/tasks for future projects.
- To ensure all project documents, e.g., project evaluation, lessons learned and other valuable information is archived.

Closing Lessons

Common lessons learned from skipping or poorly executing the closing phase are:

- Failure to obtain sponsor signoff created the never-ending project.
- Poor close-out has caused problems with transitioning projects into maintenance or programs and this causes the inability or a low capability to maintain the product.
- Lack of a project data repository (I.e., project books and archived lessons learned) to prevent future projects from repeating similar mistakes made on other projects.
- Indecision by the customer if the project accomplished what it set out to do.
- Outstanding issues were dropped or later became bigger problems to deal with.
- Failure to reward/acknowledge team successes caused low morale problems making the reassignment of staff problematic.

Input to Closing

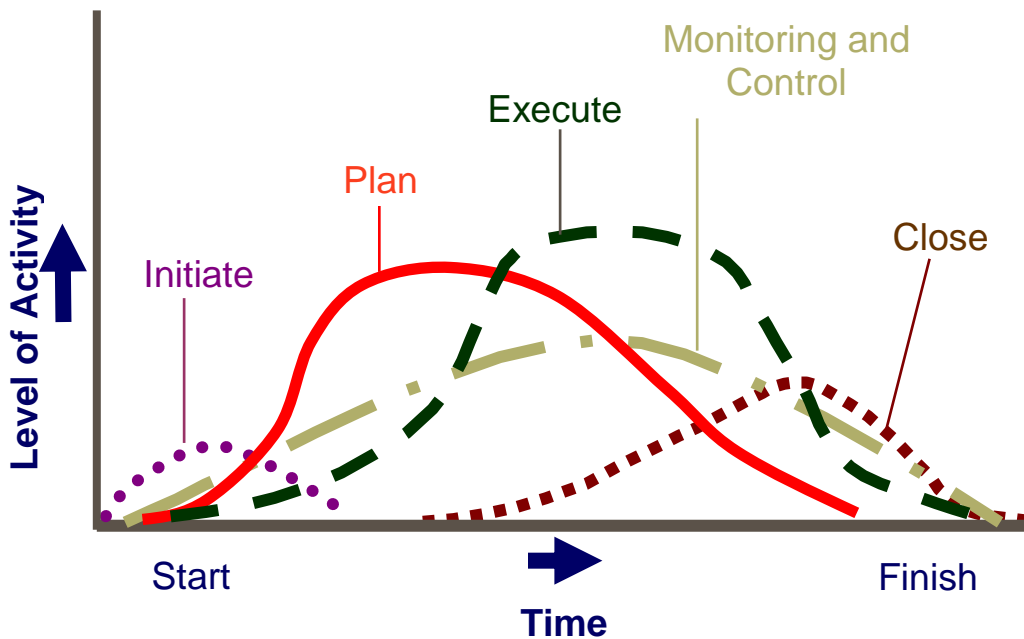
1. **Performance measurement documentation.** All documentation produced to record and analyze project performance, including the planning documents that established the framework for performance measurement, must be available for review during administrative closure.
2. **Documentation of the product of the project.** Documents produced to describe the product of the project (plans, specifications, technical documentation, drawings, electronic files, etc.-the terminology varies by application area) must also be available for review during administrative closure.
3. **Contract documentation.** Contract documentation includes, but is not limited to, the contract itself along with all supporting schedules, requested and approved contract changes, any seller-developed technical documentation, seller performance reports, financial documents such as invoices and payment records, and the results of any contract-related inspections.
4. **Other project records.**

**Closing -
Process
Activities**

The process is a course of proven actions used to guide the organization through Project Closing. Customer relationship, understanding of support roles, and sustenance of the developed product as well as performing these activities has been proven to increase the quality of future projects.

**Remember -
The closing
process
overlaps with
other
processes**

Typically during the initial stage of the Closing phase the amount of work activity and staff is declining. Remember the Closing process overlaps the other processes as depicted below. Many times it is necessary to do some of the Closing work (I.e. closing contracts, documenting Lessons Learned and compiling this information for the Project Evaluation Report) during the end of the Controlling and Executing stages to ensure the success of the project's closure.

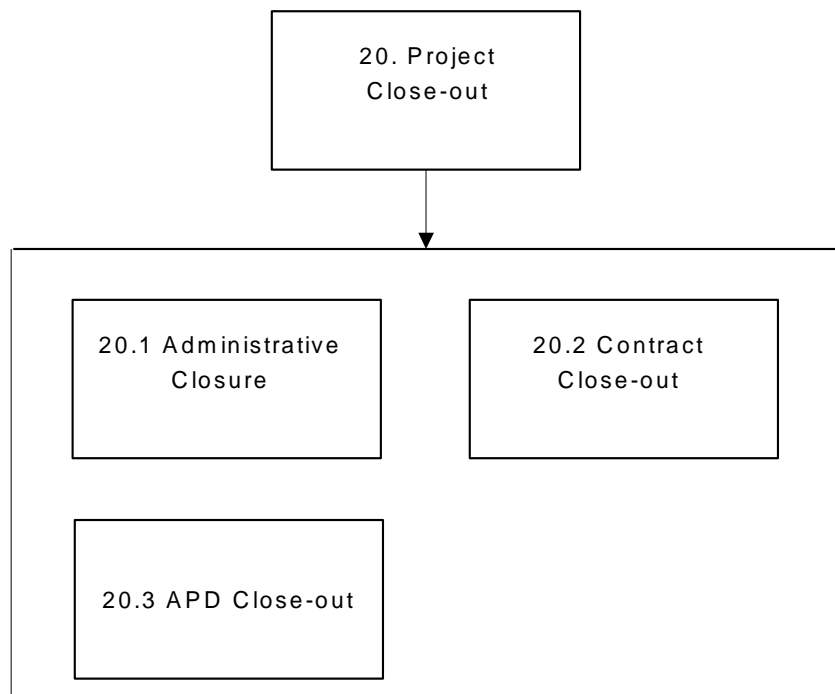


**Closing
Process
Activities
Diagram**

The project management process activities are diagramed then followed by brief description of each activity. The diagram is numbered to correspond to the “Project Management – Overview Reference” located in the Introduction of this process guide. The overview represents closing as a single project management step (#20) because most of the project management closing work is not serial. However, for reading purposes we have broken this single step into two distinct sub steps.

A description of the project management sub steps follows the diagram. A sub step title is indicated in bold in the left-hand column.

The actual work activities to be closed by the teams are defined in the Project Evaluation Reports. The standard templates for Project Evaluation Reports can be found in the closing templates section of this guide.



**20. Close
Project Plan
Activities**

This process step has two sub steps that are worked together to manage and coordinate Administrative Closure and Contract Close-out. Keep in mind that the project closing process does overlap the Project Control and Execution processes – meaning that during the project’s Closing process, the project management team is also

performing Project Control and Execution activities. So during the final phase of building the products of the project – several project management process activities are occurring to ensure the project’s success. All of the accomplishments, open issues, and lessons should be wrapped up in the Project Evaluation Report during the Closing phase of the project and then archived.

20.1 Administrative Closure The project manager must ensure that the administrative processes achieve proper closure and that the project has delivered the desired product or service to ascertain the project’s success.

(Project Evaluation and Lessons Learned Checklist) To successfully close-out a project, the Administrative and Formal Acceptance documents, including relevant Transition Checklists to roll an application into operations/maintenance, must be agreed to and signed by the appropriate parties to finalize the Administrative processes. These agreements, along with the Project Evaluation and Lessons Learned must then be archived in the standard project directory. Archiving project documents will increase the department’s knowledge aptitude for use on future projects.

20.2 Contract Close-out Contract Close-out could begin during the planning stage and continue into the close out of the project depending upon the type of contractors used on the project.

(Contract Close-out) The goal of Contract Close-out is to ascertain the finality of all project contracts. Completing this sub process provides the project the added quality assurance needed to simplify audits especially if Contract Close-out Templates for each contractor are added to the project book and then archived.

Contract Close-out should maintain strong links to the Planning, Executing and Controlling processes and to all related contract documents and to the project’s procurement and contract process.

See Contract and Procurement Management Plan Template.

20.3 APD Close-out If project was federally funded, the APD closing process must be executed before the project can be closed.

Output from Closing

1. **Project archives.** A complete set of indexed project records should be prepared for archiving by the appropriate parties. Any project-specific or program-wide historical databases pertinent to the project should be updated. When projects are done under contract or when they involve significant procurement, particular attention must be paid to archiving of financial records.

2. **Formal acceptance.** Documentation that the client or

sponsor has accepted the product of the project (or phase) should be prepared and distributed.

3. **(Phase end) Lessons learned.**

4. **Contract file.** A complete set of indexed contract records should be prepared for inclusion with the final project records. The Contract and Procurement Management Plan Template recommends a standard filing index for project records.

5. **Formal acceptance and closure.** The person or organization responsible for contract administration should provide the seller with formal written notice that the contract has been completed. Requirements for formal acceptance and closure are usually defined in the contract. – PMBOK.

**Tools and
Techniques**

1. **Performance reporting tools and techniques.** (Outputs of information for closing).

2. **Lessons learned facilitation.** The key team player should facilitate the lessons learned session to provide and record various perspectives using the Lessons Learned Template.

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