



**Chandler • Arizona**

**Project Management  
Methodology  
Guidelines**

**Project Management Methodology  
&  
Step-by-Step Guide  
to  
Managing Successful Projects**

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# 1. Project Management Overview

## 1.1. Background

This manual was developed to guide project managers through corporate project management methodology. The project life cycle consists of four major phases: Initiation, Project Planning, Project Execution & Control, and Project Closeout. Documents and Templates supporting the project management process have been tailored to meet the need of having a “Basic Toolkit” of pre-designed forms. Forms and sample reports are included in Appendix B and referenced throughout this manual. Hyperlinks are provided to take you directly to the tools if you are using an electronic copy of this manual.

This manual presents a framework for managing projects using basic tools needed for success. The framework should be modified for each individual project as it applies to the given effort. This model provides a methodical approach to conducting projects so that they meet the needs of the project sponsors successfully and consistently. A [Glossary](#) (Appendix A) of common project management terms is included to help standardize terminology throughout the organization.

## 1.2. An Overview of the Project Management Philosophy and Mission

In today’s business environment, two factors have become common: change and complexity. The nature of business has incorporated these factors into our everyday lives. We work in an environment of constant change and increasing complexity, and must be competitive, productive, customer-focused, and profitable.

Much has been written about change in the business community. Indeed, we all know the one constant is the existence of change. Marketing strategies, manufacturing strategies, service strategies - all must accept the realization that as soon as the details are spelled out, factors in the marketplace will demand that the strategy be revisited. Managing change has become a key ingredient for today’s successful business.

Business has also become extremely complicated. This complexity is related to the number of factors involved in the effort, the global scope of markets, and the sheer size of the efforts being undertaken. Even small decisions often involve the interplay of hundreds of variables.

Project management is both an art and a science. The processes presented in this document illustrate the science of project management. The science consists of a systematic approach using a standard methodology. The art consists of “soft skills” including leadership, trust, credibility, problem solving, and managing expectations. The art of project management is developed through experience, practice, and intuition. A project manager who is skilled in the art instinctively knows how and when to react to

project problems. Project management is equally divided between the art and science and a successful project manager utilizes and refines both skill sets to effectively manage projects.

### 1.2.1. The PMO's Mission

The Project Management Office (PMO) will ensure effective implementation of corporate strategic objectives by providing leadership and oversight of projects and programs. The PMO will utilize industry recognized project management processes and disciplines to become a center of excellence offering project management resources, consultation, tools, training, support, and planning to any organization or individual within the organization.

### 1.2.2. What Is A Project?

Projects have become the new way of accomplishing and managing business activities. Projects are the temporary assemblage of key personnel designed to accomplish specific business objectives with identifiable customers in mind. A project has a beginning and an end. The project team dissolves once the objectives are met. It is fluid and driven by the specific needs of that business. The project approach to managing business activities embraces change and complexity.

Projects can be defined in many different ways. However, there are some traits that all projects have in common. Typically, these traits are used to identify what a project is. The most distinguishing feature is a *specific time frame*. All projects have a beginning and an end. Many efforts are called "projects" but actually become programs as they extend indefinitely and cover broader, less specific business objectives. Projects must *have a clear, definitive goal or objective*. The objective is specific, identifiable, and can be accomplished. A project usually involves varied activities, which produce quantifiable and qualifiable deliverables that when added together, accomplish the overall objective.

#### Key Characteristics of Projects

- A project has boundaries, so its extent is defined.
- A project is a one-time effort, usually requiring finite resources.
- There are distinct start and end dates for projects.
- You know when you have reached the end of the project.

### 1.2.3. What Is Project Management?

Project Management is the process of achieving project objectives (schedule, budget and performance) through a set of activities that start and end at certain points in time and produce quantifiable and qualifiable deliverables.

Successful project management is the art of bringing together the tasks, resources and people necessary to accomplish the business goals and objectives within the specified time constraints and within the monetary allowance. Projects and Programs are linked directly to the strategic goals and initiatives of the organization supported.

#### 1.2.4. What Is A Project Management Life Cycle?

The process each manager follows during the life of a project is called the Project Management Life Cycle. A proven methodical life cycle is necessary to repeatedly implement and manage projects successfully.

During the life cycle of **any project**, proven and tested project management processes or best practices are should be initiated. The types and extent of processes initiated depend on the nature of the project, i.e. size, probability of failure and consequences of failure. Strong and effective leaders apply process to protect all projects.

The Project Management Institute (PMI) provides guidance for project management in the Project Management Body of Knowledge (PMBOK). Every project has a life cycle, with a beginning, a life and an end (defined by accomplishing the objective). The following defines a typical project life cycle and shows the relationship between PMBOK Life Cycle Phases and our Life Cycle Phases:

PMBOK Phases	Our Methodology Phases
Initiation	Initiation
Planning	Planning
Executing Controlling	Execution and Control
Closing	Close-out

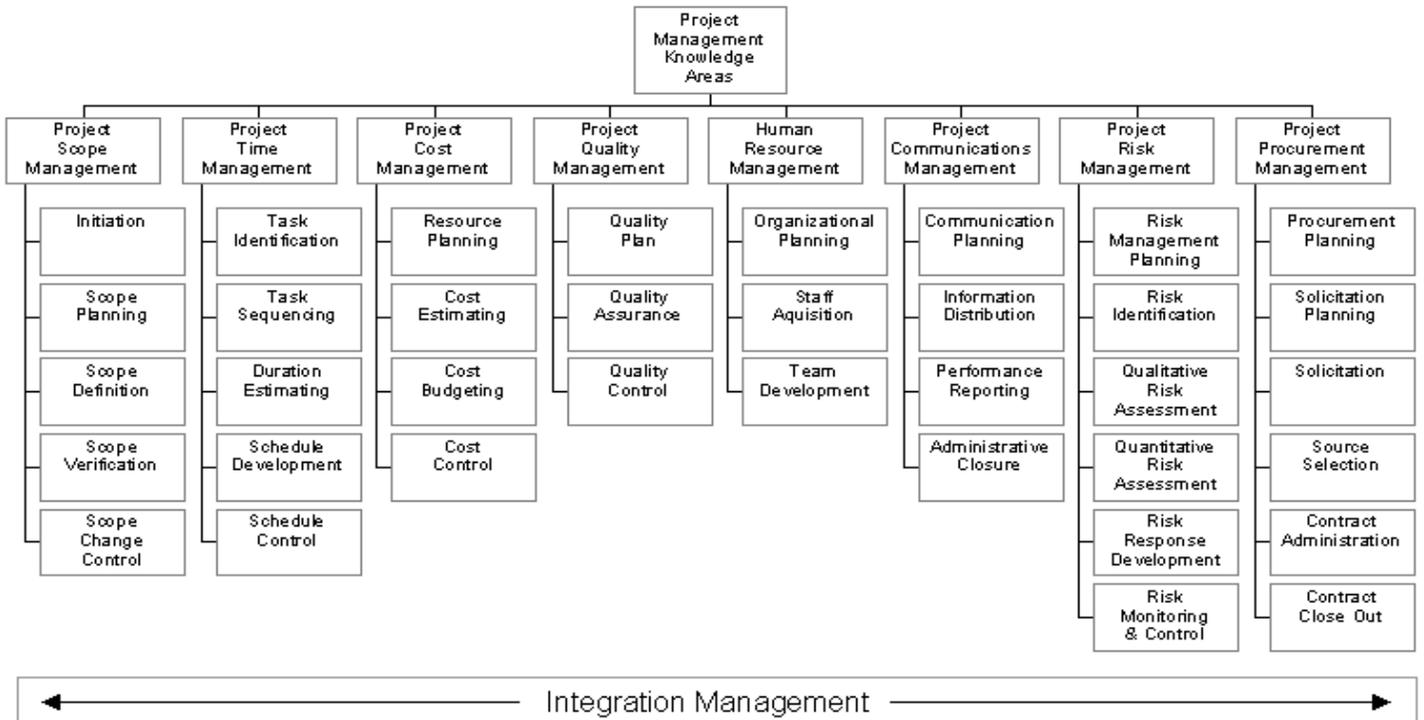
There are 9 major knowledge areas of project management that PMBOK describes as required expertise for all project managers. They are:

- Scope Management
- Communications Management
- Risk Management
- Human Resources Management
- Procurement Management
- Time Management
- Cost Management

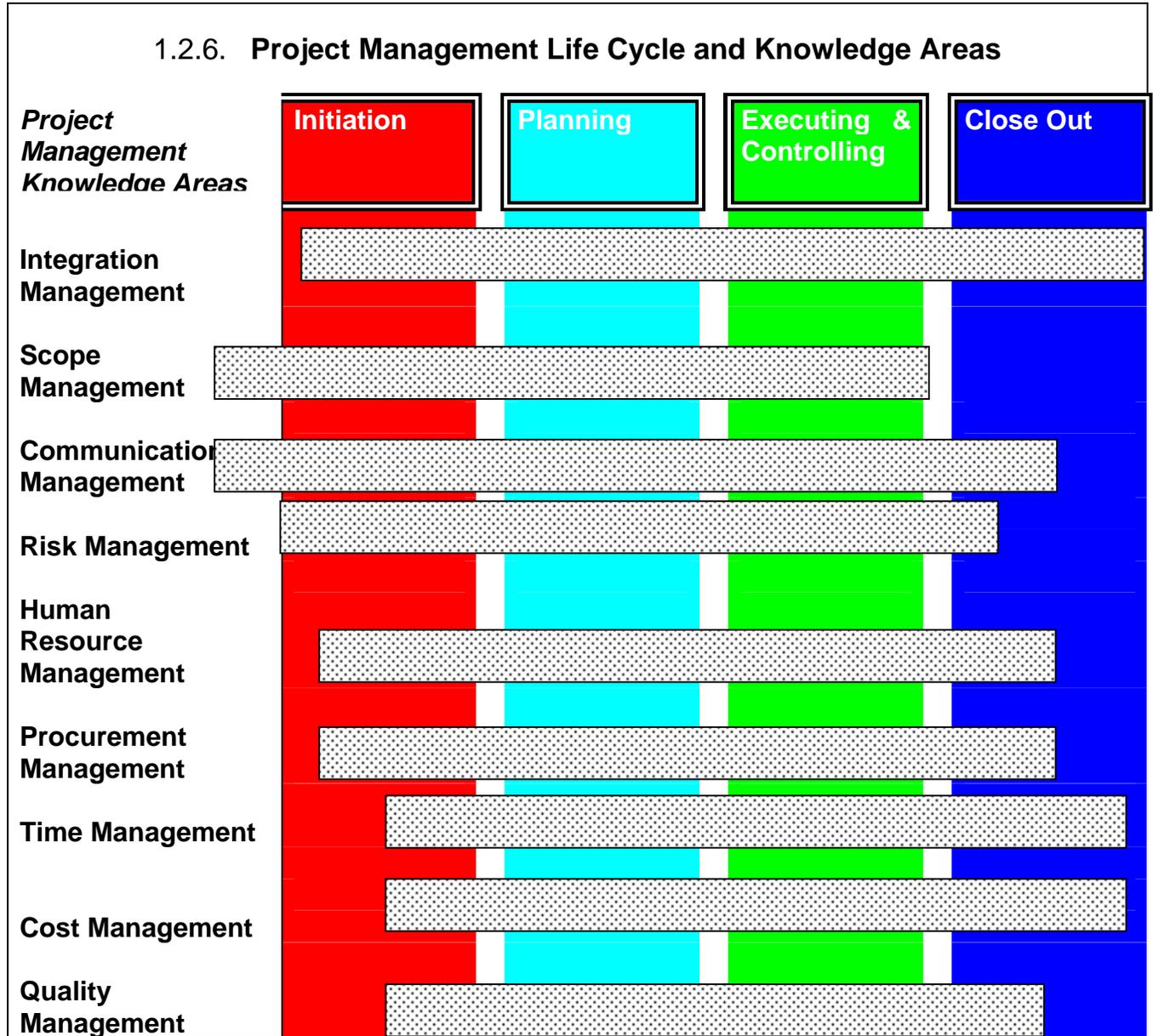
- Quality Management
- Integration Management

Each of these management areas consists of processes, tools and techniques that are produced and/or applied to some degree during the course of any project. The following set of illustrations depict the project management life cycle, knowledge areas, and processes used:

### 1.2.5. Deliverables Typically Produced for Each PMBOK Knowledge Areas

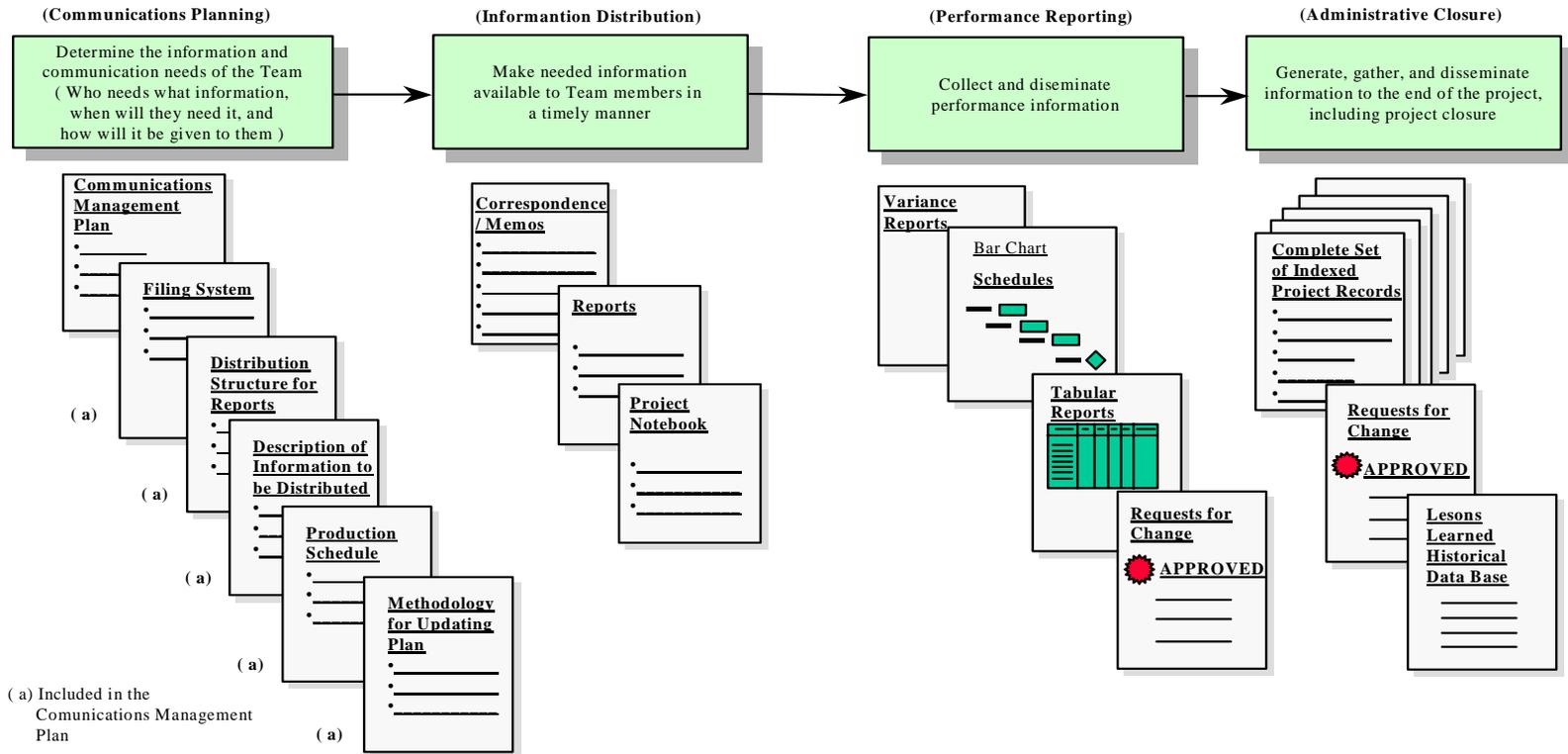


**Project Management Life Cycle and Knowledge Areas** - An example of a typical project management life cycle with the 9 PMBOK knowledge areas spread across each phase to show the where the knowledge area is used.



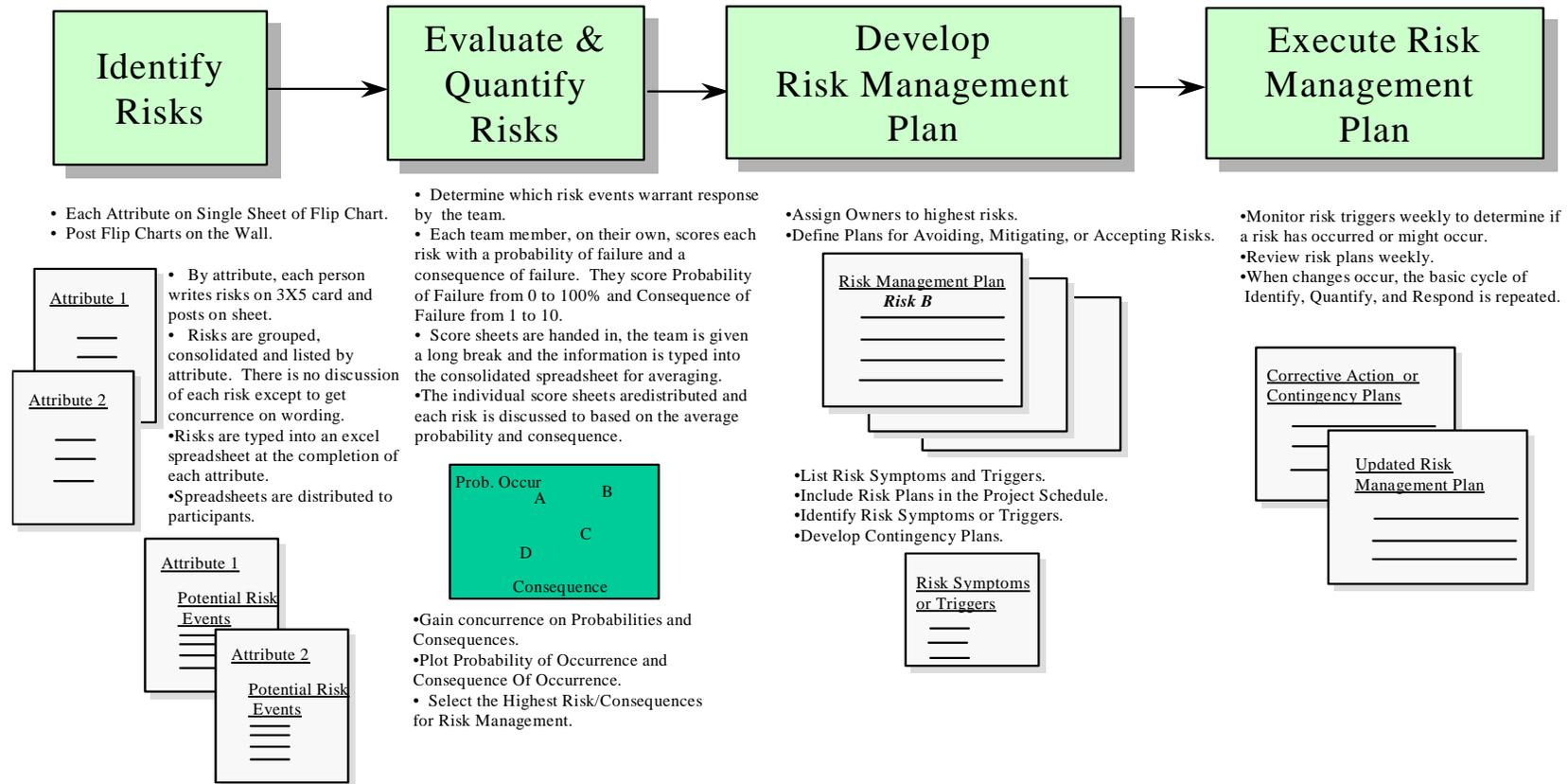
# COMMUNICATIONS MANAGEMENT PROCESS

*“Project Communications Management includes the Processes required to ensure timely and appropriate generation, collection, dissemination, storage, and ultimate disposition of project information.”*



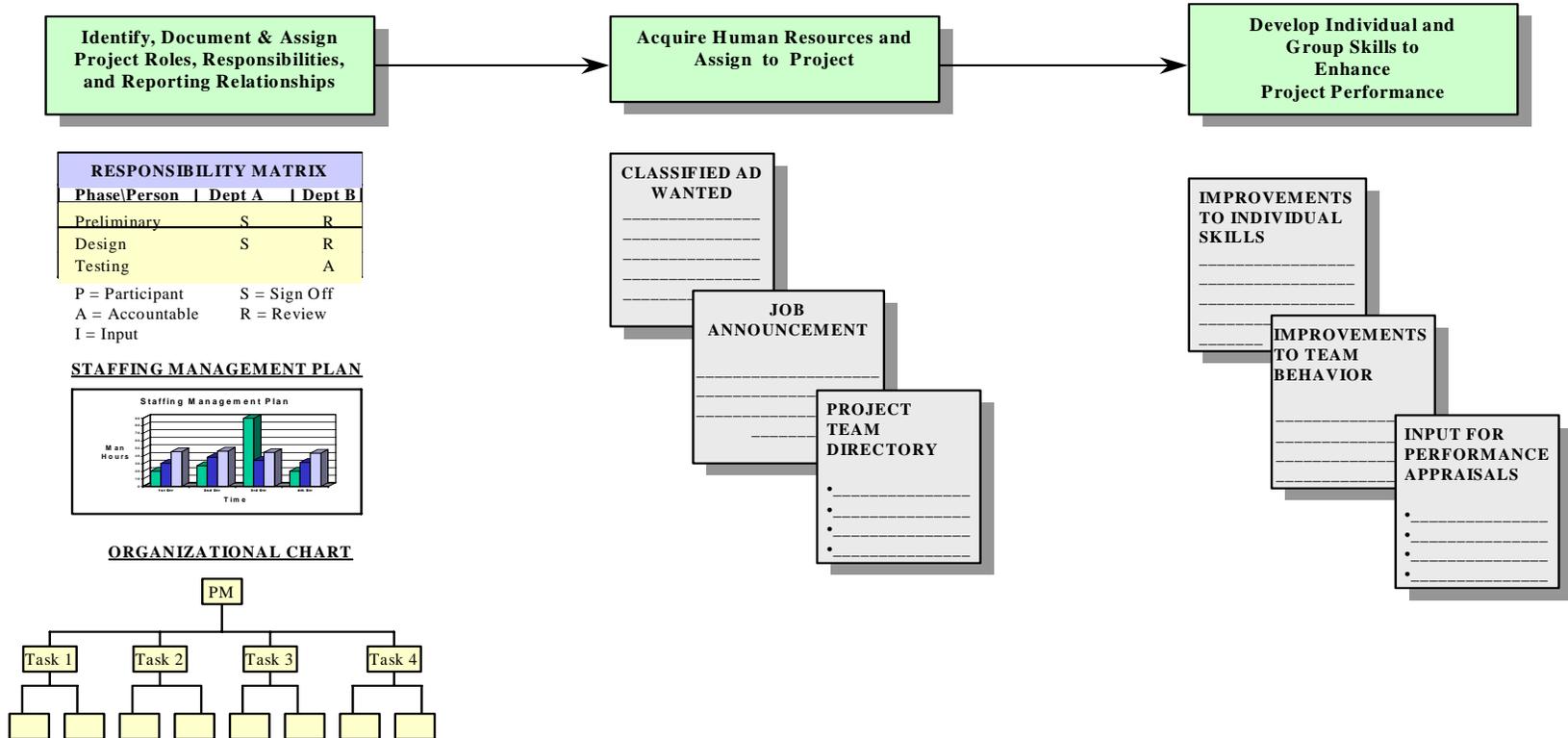
# RISK MANAGEMENT PROCESS

“Project Risk Management includes the processes concerned with identifying, analyzing, and responding to project risk.”



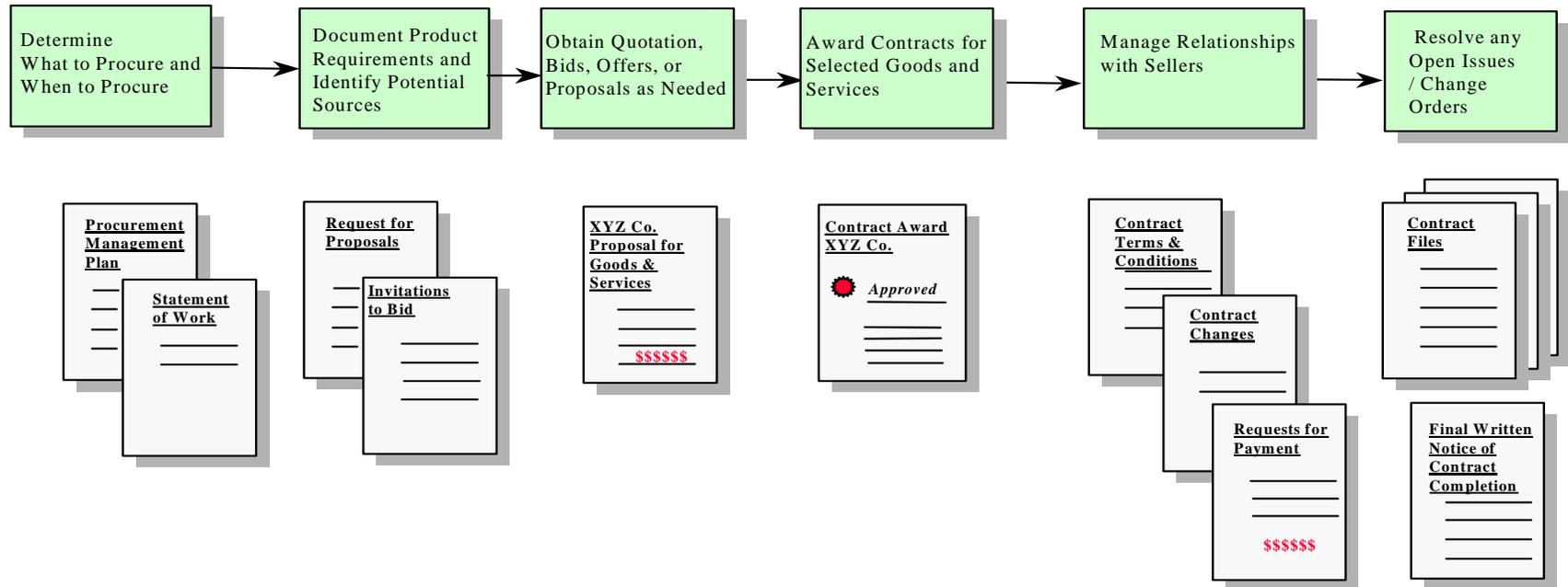
# HUMAN RESOURCES MANAGEMENT PROCESS

*“Project Human Resource Management includes the Processes required to make the most effective use of people involved with the Project.”*



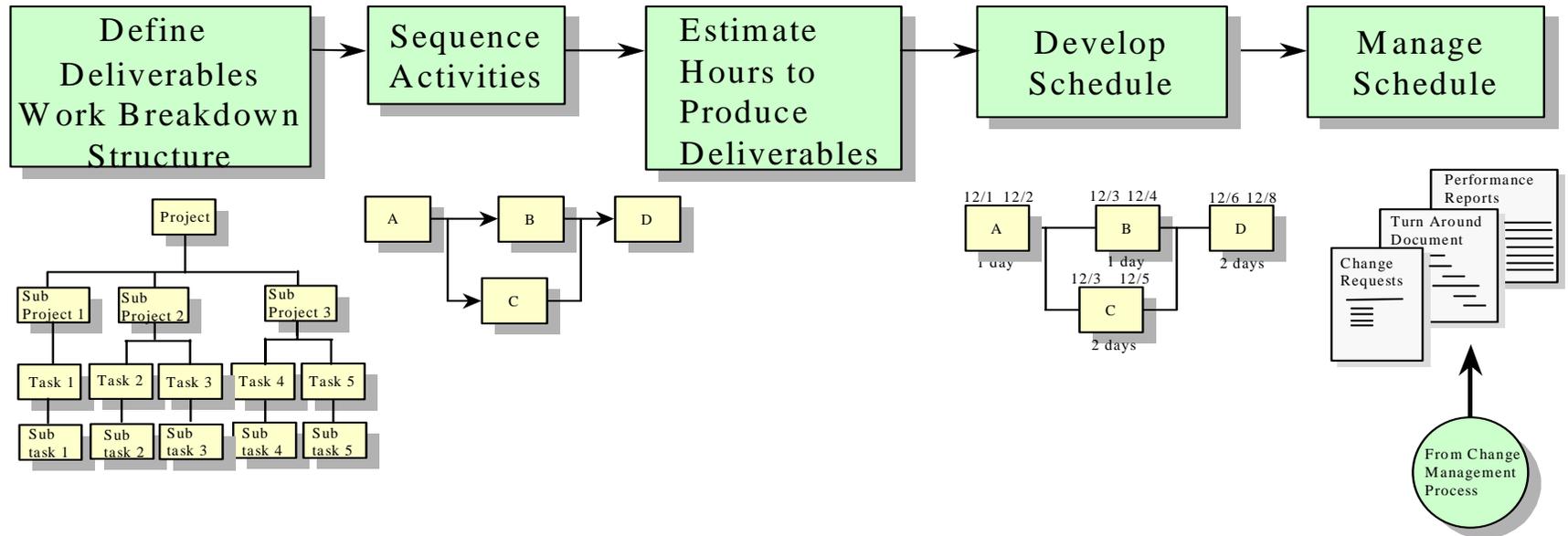
# PROCUREMENT MANAGEMENT PROCESS

*“ Project Procurement Management includes the processes required to acquire goods and services from outside the performing organization ”*



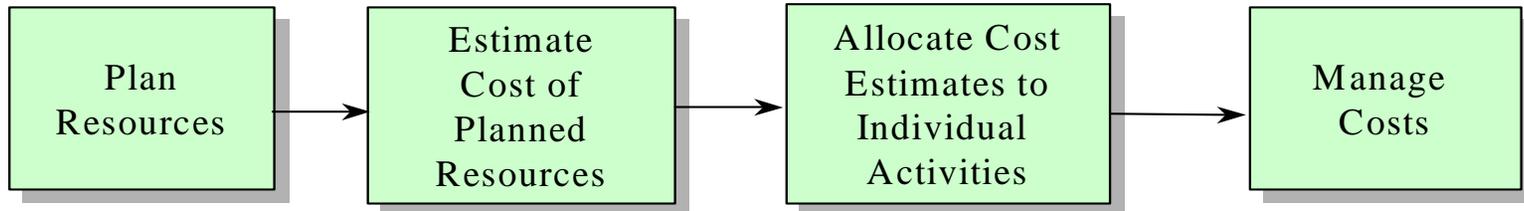
# TIME MANAGEMENT PROCESS

*“Project Time Management includes the processes required to ensure timely completion of the project.”*



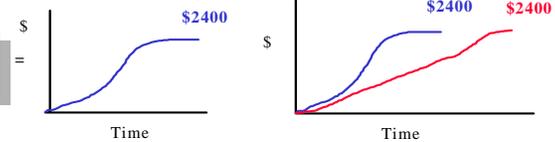
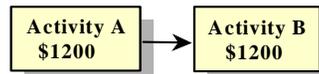
# COST MANAGEMENT PROCESS

*“Project Cost Management includes the processes required to ensure that the project is completed within the approved budget”.*



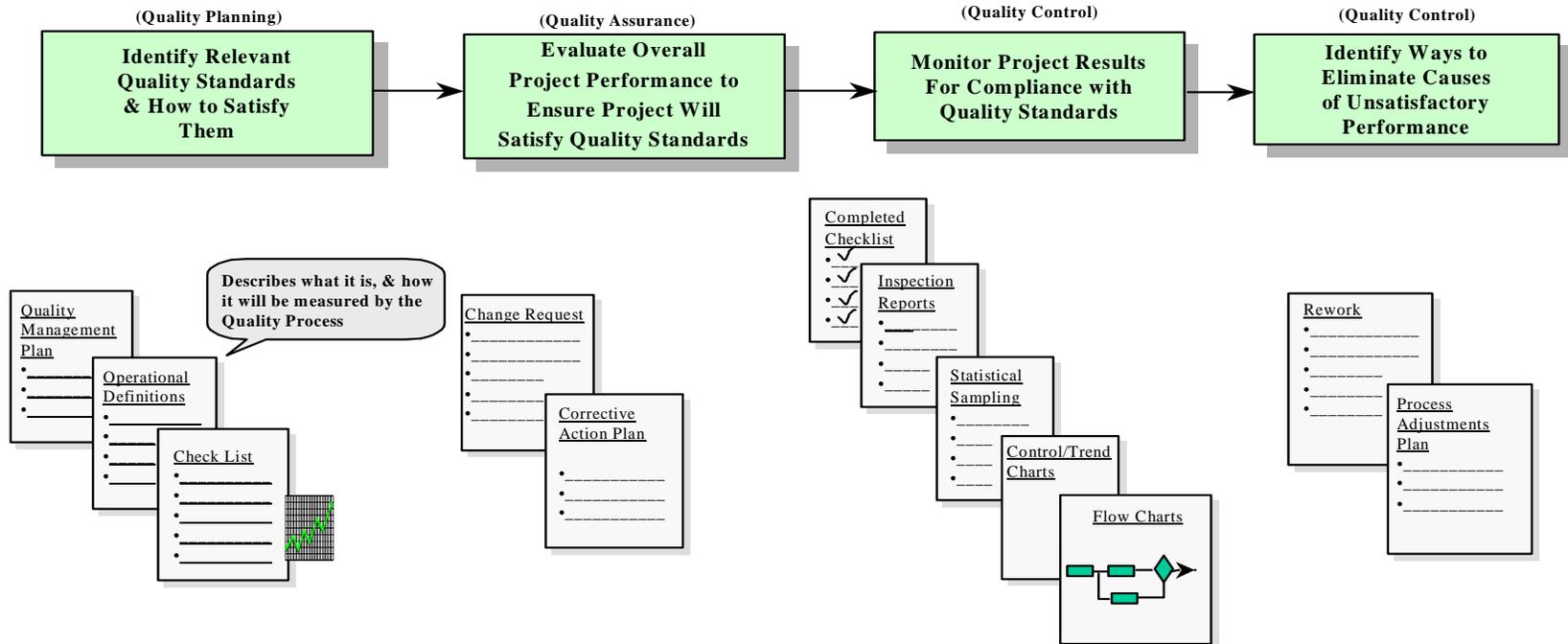
- **People**
- **Material**
- **Equipment**

32 manhours x \$75 per manhour = \$2400



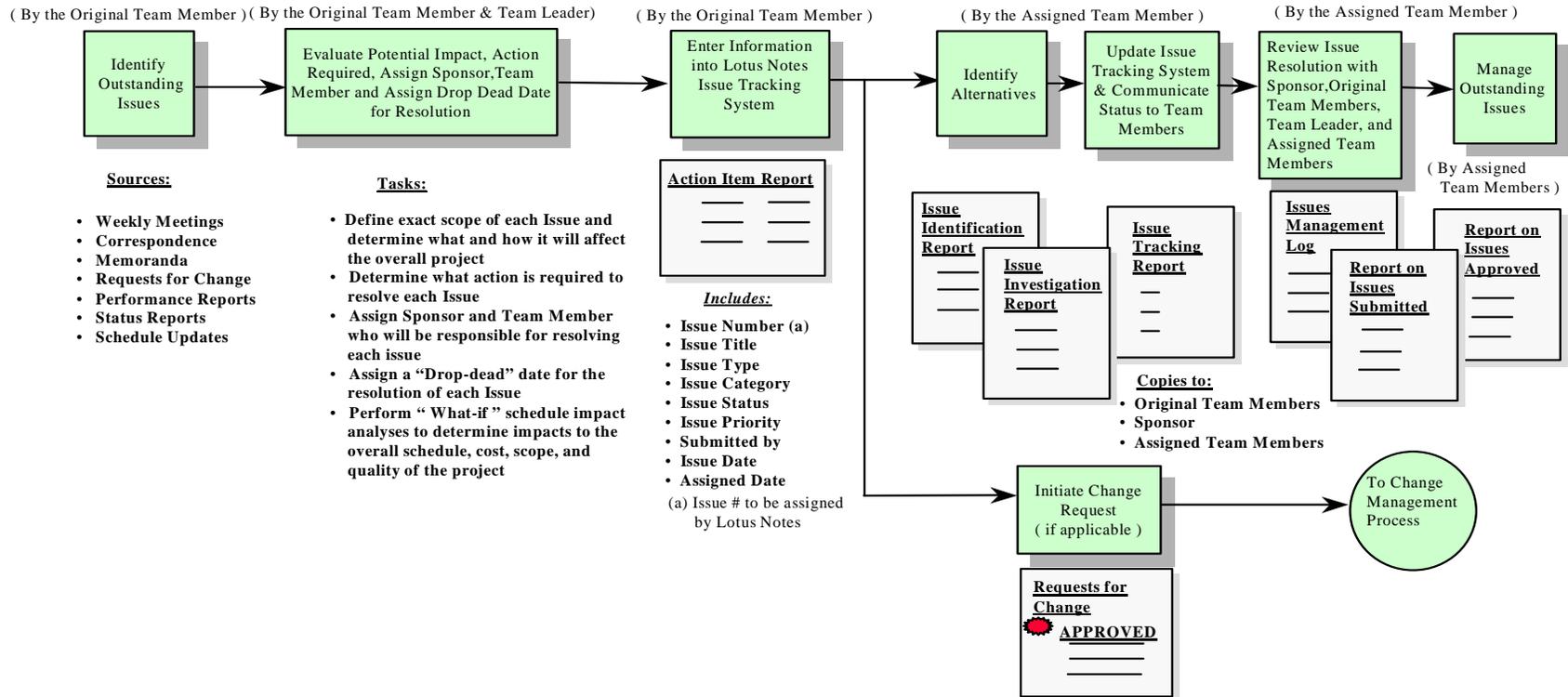
# QUALITY MANAGEMENT PROCESS

*“Project Quality Management includes the Processes required to ensure the Project will satisfy the needs for which it was undertaken.”*



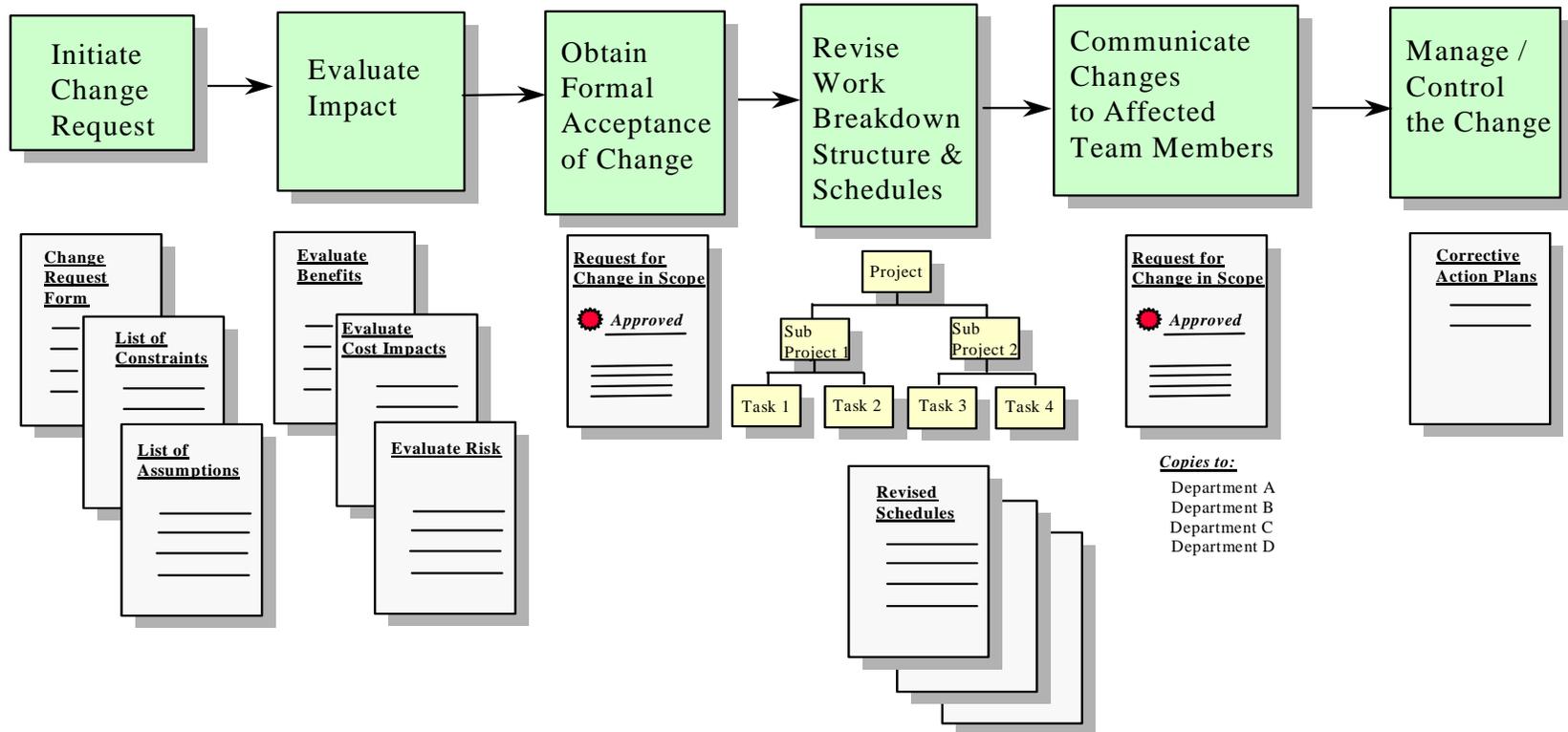
# ISSUES MANAGEMENT PROCESS

*“Project Issues Management includes the Processes required to identify, resolve, and control in a timely manner factors which could influence the overall scope, time, cost, risk, and quality of the project.”*



# CHANGE MANAGEMENT PROCESS

“ Project Change Management includes the processes required to control changes to the project scope”



### **1.2.7. Elements of Successful Project Management**

There is no single process that makes a project successful. It is the careful orchestration of a number of different elements.

The factors that lead to successful projects include:

- Clearly defined goals and objectives
- A well-defined project management process
- A proven set of project management tools
- A clear understanding of the role of project management.

The project manager has a broad array of behavioral and management techniques from which to choose. The objective of the selection process is to choose techniques that ensure high-quality, on-time deliverables that are accepted by the business and that fit the conditions and environment.

## **1.3. Project Approach Selection Technique - Selection Indicators**

### **1.3.1. Indicators for User Workshops**

- The participants have the authority to confirm the deliverables for the business. Usually this implies that they are management representatives. If they do not have this authority, the advantage of the short decision cycle is lost.
- There is a basic understanding and spirit of cooperation among team members, and a motivation to produce deliverables within a limited time frame.
- A qualified facilitator is available. If this is not the case, the risk of failure is high. An unsuccessful workshop can very quickly damage the confidence of the business users and the project team.
- Appropriate facilities and equipment are readily available.

### **1.3.2. Indicators for Interviewing**

- A large number of business people must be involved; representation by a small group is not acceptable.
- Fact gathering is the main objective.
- Individual opinions are easier to gather from interviews.
- The internal political situation does not allow for user workshops.
- The interviewees will not speak openly in groups.
- Time and resources for interviewing are available.

### **1.3.3. Indicators for Questionnaires**

- Questionnaires are often used to assess the current situation.
- The main objective is fact gathering; the subject matter does not need verbal explanation and immediate feedback.
- Opinions must be gathered from a large group of persons.
- Time and resources for interviewing are not available.

### **1.3.4. Indicators for Teamwork**

- The task to be performed requires the participation of several team members to produce a deliverable and reach consensus.
- The task to be performed is a logical extension of previous activities, such as a user workshop or interviews.
- The task to be performed needs the skills of several persons.

### **1.3.5. Indicators for Individual Work**

- The task to be performed needs the skills of only one person.
- The task to be performed does not need immediate communication with other persons.

### **1.3.6. Indicators for Classical Progress Control**

- The scope of the deliverable to be produced cannot be further reduced
- Management commitment to meet a time box is not strong enough

## 2. Project Management Step-By-Step Guide

### 2.1. *The Initiation Phase*

#### 2.1.1. Purpose

The purpose of this phase is to develop a high level plan and risk assessment for a proposed project and to provide information for portfolio assessing strategic viability the project. Emphasis is placed on analyzing the project sponsor's strategic requirements as well as immediate needs. Several high-level project management deliverables will be produced during this phase. These high level deliverables will provide a foundation for estimates and for the Project Charter.

#### 2.1.2. Project Manager Role:

On small engagements, the project manager may not be available during this phase. The sponsor may conduct the assessment. For major opportunities, the project manager should be assigned and work with the sponsor to determine a proper solution and derive an accurate scope of the project.

- Assist the account representative with formulating a solution.
- Assist with identifying deliverables (scope) that will be produced to complete the solution.
- Assist with a high level estimate of work to be performed.
- Assist with determining project scope
- Assist with developing a high-level estimation of the project size in hours and cost.
- Assist with proposal development.
- Assist in developing a high-level work breakdown structure.

#### 2.1.3. Inputs

- Interviews with customer and other key personnel
- Strategic documentation
- Customer literature
- Lessons learned from previous projects performed for project sponsor

## 2.1.4. Outputs

- [Opportunity Summary](#)
- [Pre-Project Budget Worksheet](#)
- [Opportunity Assessment Detail](#)
- [Quality Assurance Template](#)
- [High Level WBS](#)
- [High Level Risk Assessment](#)
- [Client Cost Benefit Analysis](#)
- [Problem Identification](#)
- [Proposal Checklist](#)
- [Project Proposal Document](#)
- [High Level Project Charter](#)

## 2.1.5. Step-By-Step Process

### 1. Interview Customer

- Conduct interviews with the customer. Understand the customer's strategic vision for the company and the customer's objectives for achieving the vision. Determine the basic problem or need by asking open-ended (not yes or no questions) that probe to get beyond the symptoms to the real problem or need. Review the proposed solution and determine what other solutions that should be considered. Review the process the customer used to evaluate the problem and identify possible solutions and the reason the customer selected the requested solution. Ask "why" often. Ask questions to verify the basic scope of what the customer is asking for. Obtain from the customer any documentation and company literature that might be pertinent to the request.

### 2. Conduct Internal Research

- Interview other personnel from your group and the customers group. Review documentation. Develop processes charts to study the "current state" of the organization, function or process. Obtain organization charts.

### 3. Develop Solution and Requirements

- Assist in developing a solution, consulting with subject matter and technical experts as needed. During this phase, the project manager should primarily focus on understanding what the project sponsor is trying to achieve. If the project is highly technical, the use of subject matter experts is recommended.

#### 4. Review Lessons Learned

- A project repository of lessons learned for use by project managers is created as a reference for present and future projects. The project repository is a central database or file, which contains pertinent project information. This includes the project notebook as well as additional information regarding the project successes and pitfalls. The project manager should review the lessons learned from previous projects to assist in assessing project risks, maintaining project schedules, and understanding potential areas of concern experienced previously on other projects.

Review the issues logs from previous projects to identify potential risks (all issues were once risks).

#### 5. Review Customer Requirements

- The project manager is responsible for identifying and understanding the customer requirements of the project. By reviewing any existing requirements, business case or proposal documents, the project manager should be able to determine the purpose of the project and the expectations. The project manager must identify all requirements that are unclear, incomplete, unfeasible, contradictory, or that in some way may prevent the successful completion of the project. Meeting with the project owner to discuss the requirements and any vague items is required. The project manager must schedule a time with the project owner as soon as the project manager is assigned to review the project and understand the expectations. A copy of the Project Sponsor Assessment Checklist should be used as a starting point and all project deliverables should be communicated, agreed upon, and documented. The project manager will provide a copy of the meeting minutes documenting the agreed upon deliverables. The meeting minutes should be distributed to the project owner within 24 hours of the meeting. This allows both parties to see the results of the meeting and address any disagreements immediately.

#### 6. Define Project Roles

- The question of what level of authority the project manager should possess is natural when consideration is given to the large number of people that must be depended upon for results, but are not under the project manager's direct control. The question becomes even more relevant considering the differences in responsibilities of the project manager and the functional managers. The project manager is ultimately responsible for developing a cohesive project team motivated toward success making the project managers leadership qualities, interpersonal skills, and credibility are far more important than formal authority. A project manager possessing these attributes can usually find a way to "make it happen" with or without formal authority, but the project owner should give the project manager the level of authority that enables the project manager to successfully accomplish the assigned responsibilities. The project owner should provide the project manager with a formal statement or contract detailing the scope of authority being granted. The level of authority should be directly

proportional to the expectations and responsibilities. When the project manager is unable to resolve issues or negotiate solutions at the lower levels of the organization, the project owner is responsible for escalating those issues to higher levels.

In order to have a successful project, all project stakeholders must know and understand their role in the project. It is the project manager's responsibility to communicate these roles to the project stakeholders.

**Project Manager:** The project manager is responsible for managing the project's scope, schedule, and cost to support the owner's expectations for the successful completion of the project. Typical duties include:

- Managing the development of the scope definition and project plans.
- Providing team leadership for problem resolution by working with the lowest organizational levels possible and escalating, as necessary.
- Monitoring schedule and costs versus project progress to identify problems that could potentially extend the schedule or overrun costs.
- Taking, directing, or recommending corrective action when scope, schedule, or cost variances threaten the project.
- Serving as the central point of contact for the project and communicating project status to the project owner and other stakeholders.
- Providing input to the performance reviews of the project team members.
- Negotiating a resolution to team member resource conflicts with their functional managers.

**Project Owner/Sponsor:** The project owner or sponsor should be a director or higher-level member of the department who is the largest stakeholder in the project or who will receive the greatest benefit by the project's successful completion. The owner assumes the overall responsibility for the entire project. The project owner will appoint a project manager to manage and control the project. The project owner may provide the project manager the expectations of the end product or results, the minimum success criteria, and the level of interface expected during the project life cycle. The project owner is responsible for the following:

- Champion the project
- Maintaining enough involvement with the project to ensure that the desired outcome is attained.
- Granting a sufficient level of authority to the project manager required for the project's success.
- Providing or negotiating support when the project manager is unable to resolve problems at a lower level.
- Providing ongoing performance feedback to the project manager as well as providing input to the project manager's performance review.

**Project Team Members:** The project team members are responsible for ensuring that their group's responsibilities are identified and accurately planned, resources are available to support the budget and schedule, accurate information is provided for project status, and the project manager is assisted in problem resolution.

## 7. Assemble Core Project Team

- The project manager must determine what skills are needed to successfully complete the project. Information gathered from reviewing the business case, reviewing the lessons learned from previous projects, and identifying the requirements are used to determine what the project team composite should be. Once the needed skill sets for the project have been identified, the staffing requirements must be acquired. Unfortunately the most knowledgeable people may not be available for the project due to higher priority projects, so the project manager must ensure the resources assigned are capable of successfully meeting the project requirements. This requires gaining approval from functional managers for employing their personnel on the project team and obtaining the training necessary for project success. When building the project teams consider the following:
  - Does the individual have the necessary skills or is additional training needed?
  - Does the individual or group have previous relevant experience and, if so, did they do well?
  - Is the individual or group interested in working on the project?
  - Will the project team members work well together?
  - Will the individual or group be available when needed?

## 8. Develop High-Level Work Breakdown Structure (WBS)

- A high-level WBS should be developed by the project manager to begin defining the scope of the project. The project manager should develop a high-level WBS from the information gathered from the project sponsor. The WBS is a product oriented hierarchical division of project elements that organizes, defines, and establishes the total scope of the project. This WBS will identify all of the major deliverables that make up the total solution. During the detailed planning meeting and work session to be held during the Planning Phase, the project manager will review the high-level WBS with the project team and further decompose the deliverables into manageable work packages prior to developing tasks and building a schedule.
- From previous projects, obtain a WBS that closely models the project being developed. Use only the top two or three layers of deliverables to develop a high-level WBS. This step will result in a high-level WBS that identifies major divisions of the project as they relate to the overall objectives and will be attached to the Project Charter.

## 9. High-Level Risk Assessment

- During this phase, the project manager should begin to identify major risks to the project. It is not important to have detailed plans at this time, but it is important to begin to identify what could potentially impact the success of this project. Once identified, they should be included in the high-level Project Charter completed during this phase.
- The project manager, along with the project team, will identify major project risks and develop risk management plans during the Planning Phase. In identifying the major project risks, the sources of potential risk must be determined. The project manager will begin with the work breakdown structure (WBS) to determine potential risks associated with the project. Some of the more common risks include:
  - Changes in project requirements and/or scope
  - Unrealistic schedules and/or budgets
  - Misinterpretations or misunderstandings
  - Unclear roles and responsibilities
  - Unskilled staff
  - Availability of staff
  - Undefined success criteria

Managing risk falls into one of the four following categories:

- **Avoidance** involves changing the project plan to eliminate the risk or condition or to protect the project objectives from its impact.
- **Transfer** is seeking to shift the consequence of the risk to someone else. This does not eliminate the risk.
- **Acceptance** is understanding the risk and accepting the consequences should the risk occur. An example would be accepting extended project duration due to resource availability.
- **Mitigation** involves preparing a plan that describes the actions to be taken before a risk occurs to minimize any potential impact.

A **contingency plan** for a risk event is the identification of steps which will be accomplished if the risk strategy is implemented. The steps will be included in the project's schedule and cost baselines.

The decision to prepare a risk avoidance and risk contingency plans depends on the circumstances associated with each project. In most cases these plans should be prepared for a specific area of risk if:

- The risk is moderate or high,
- The probability of occurring is moderate or high, and

- The impact is significant.

If any one of these factors is not present for an area of risk, it may not be necessary to prepare risk avoidance measures or a risk contingency plan. Most of the risk areas center on the following:

- Resources (e.g., personal, facilities, hardware, etc.),
- Requirements definition & scope,
- Technology, and
- External dependencies.

When identifying high-level risks, be sure to consider the following risk attributes:

- Budget
- Performance
- User Attributes
- Cost or Financial
- Human Resources
- Acts of God
- Schedule Items
- Development Technology
- Business Change
- Vendor or Contractor
- Politics
- Requirements

During the Initiation Phase the project manager should assess probable risks to the project and include them in the Project Charter. A detailed analysis is not needed at this time since the risk will further analyzed during the project team Risk Management meeting.

## 10. Develop Cost Estimates

- A large number of projects fail because initial cost estimates are simply too low. It is important that project managers and account managers accurately state the estimated costs. Depending on the size of the project, costs will be tracked in different ways. Be sure to document your costs in a spreadsheet, which will later be validated when the final project plan is approved and baselined. These initial estimates will help prevent cost issues from arising once the total project cost are determined and agreed to. Be sure to include significant equipment, human resource, contract, and supply costs.
- The project team should use a typical or similar completed project, if available, plus lessons learned, to estimate time and cost at the lowest level of the high-level WBS. The costs will “roll-up” to the higher-level tasks to form the overall project cost. Be sure to consult with people who have experience in completing the described tasks. All organizations have some type of subject matter expert that could help validate a cost estimate.

## 11. Develop High-Level Project Charter

- The purpose of the [Project Charter](#) (Appendix B) is to provide a clear and consistent definition of the project’s vision/mission, scope and objectives. The project charter is developed early in the project management life cycle. It

contains the vision/mission, owner identification, scope, objectives, assumptions, constraints, time/milestones, cost/budget, quality requirements, and major risks of the project. The project manager may develop an initial draft of the project charter, however, the project team will be responsible for developing the final project charter during the detailed planning meeting to be held at the beginning of the planning phase.

- The project team members will review the project charter in order to obtain buy-in. This development process is required for a full understanding and acceptance of the project by the project team. After the project team develops the project charter, the project manager will submit it to the owner for approval. The project charter acceptance will provide an agreement between the owner(s) and the project team. Most project failures are the result of one or both of the following: (1) poor definition of the vision/mission and scope and (2) not having buy-in and commitment by the owner and project team (3) poor estimating.
- Elements of the high level charter would include:
  - Strategic vision supported by the project
  - The problem and/or need
  - The project solution
  - The high level scope of the project.

## 12. Review with Owners for Approval

- The project manager will meet with the project owner to review the project charter, high-level WBS, and high level risk assessment. The project manager will arrange a time that is convenient for the project owner to spend approximately one hour to review the work that has been accomplished during this Phase. The project owner will give the go ahead for the project manager to proceed to the Planning Phase to finalize the project charter.

## **2.2. The Project Planning Phase**

### **2.2.1. Purpose**

The purpose of the Project Planning Phase is to kickoff a new project and establishes an accurate plan and schedule. The infrastructure that is established during the planning phase is critical to effectively manage the projects success. At no other time during the life of the project is the success of the project more vulnerable. During this phase, responsibilities are assigned; communications and reporting expectations will be developed and presented to the project team. Tracking systems will be established. The project team will further decompose the high-level work breakdown structure into measurable tasks. This decomposition will form the basis of the project plan and schedule. Once the project team has determined the scope of the project a Risk Management Plan can be developed. The rigor that is established during this phase is dependant on the size, visibility, and impact of the project. The effort taken during the

project planning phase is directly reflective of the project's ability to reach a successful conclusion.

### 2.2.2. Project Managers Role

- Obtain staff
- Assign roles & responsibilities
- Develop Organization Chart
- Prepare Project Notebook and Project Files
- Develop the detailed WBS
- Develop Communications Plan
- Establish reporting frequencies
- Conduct due diligence or risk assessment

### 2.2.3. Inputs

- High Level Project Charter (with attachments)
- High Level Risk Assessment
- Requirements Document

### 2.2.4. Outputs

- [Communications Plan](#)
  - [Communications Matrix](#)
  - [Issue Log](#)
  - [Action Item Log](#)
  - [Documentation Matrix](#)
  - [Status Reports](#)
  - [Organization Chart](#)
  - [Project Team Directory](#)
- [Project Charter](#)
- [Resource Request Form](#)
- [Project WBS](#)

- [Requirements Traceability Matrix](#)
- [Responsibility Matrix](#)
- [Risk Management Guide](#)
- [Project Notebook](#)
- [Developing Task Worksheet](#)
- [Project Schedule](#)

### 2.2.5. Step-By-Step Process

#### 1. Conduct a Project Team Detailed Planning Meeting and Work Session

The project manager will hold a project detailed planning meeting once the project team is established. The main purpose of the detailed planning meeting is to introduce the project and enlist the project team to continue work completing the [Project Charter](#) (Appendix B), which was started during the Opportunity Assessment & Initiation Phase. The project owner should be present to communicate expectations, goals, and success criteria. Other agenda items should be team member responsibilities, time and/or budgetary constraints, and the schedule for future meetings (communication plan). If the project's conceptual development is clearly defined, the team should work on defining the scope and objectives by creating a Work Breakdown Structure (WBS).

In order to hold a successful detailed planning meeting the project manager must determine the following:

Meeting Attendees	The detailed planning meeting attendees will include the project manager, the project owner, and all project team members. This information is listed in the agenda.
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Agenda	<p>The <b>Purpose</b> must be stated clearly to set expectations and stimulate interest in the meeting. An <b>Agenda</b> will include the meeting attendees, subjects to be covered and time for each. The meeting attendees must be listed in the agenda section that is distributed. The agenda for the detailed planning meeting will include the project owner discussing the purpose and expectations of the project. A High-level WBS will be produced and responsibilities will be assigned to the project team members. The project manager will facilitate the identification of the following:</p> <p>Business need for the project</p> <p>Vision, Mission, Scope, and Objectives</p> <p>Project assumptions, risks, and constraints</p> <p>A <b>Limit</b> to the meeting is provided to inform all meeting attendees of the time required for the meeting. A typical detailed planning meeting and work session may take several hours to several days depending on the size of the project.</p> <p>The project manager should prepare the agenda and distribute it a minimum of 24 hours before the meeting.</p>
Location	<p>The project manager is responsible for reserving an office or conference room large enough to accommodate all meeting attendees. Be sure there is ample wall space to display flip charts for the development of the WBS</p>
Equipment and Props	<p>The project manager must ensure the meeting location is equipped with the needed equipment and props for the meeting. Equipment includes overhead projectors, white boards, markers, tables, and chairs. Props include the post-it notes, easels, large paper, and tape.</p>
Meeting Minutes	<p>The project manager should designate one person at the beginning of the meeting to take the minutes. The project manager will take responsibility for distribution of the meeting via e-mail within 48 hours of the meeting. During the meeting it is helpful to have current ideas and information captured on flip charts for the visibility and focus of the project team.</p>

## 2. Develop the Detailed WBS

The Detailed WBS process found in this section should be used to develop the detailed WBS. It will result in a further decomposition of the project objective into the deliverables that must be produced to successfully accomplish the project. These deliverables are measurable in the hours and cost required to produce them. Review the project sponsor-approved proposal or business case to determine if any changes in scope have occurred during the approval process.

The purpose of the WBS and the benefit it provides are:

- It facilitates detailed planning by subdividing the project scope into smaller, manageable work efforts. These work efforts can be mapped to the individual responsibilities.
- The “owner” of each deliverable can be established and that “ownership” becomes part of the project charter.
- Tasks can be identified to produce each deliverable. The responsibility for each task can be established. That individual is then responsible for the schedule of the task.
- The detail estimated costs and budgets can be established for each WBS element, facilitating bottom-up estimating.
- It provides a framework to identify projects separately from organizations, funding sources, accounting systems, etc.

There is no theoretical lower limit to the composition of a WBS, but a limit can be determined from information about the monitoring practices (for example whether actual tasks or milestones only are tracked). At the lowest deliverable level, the scope, cost, and complexity of each unit are more manageable. As a general rule, nouns should be used to describe deliverables. Resource responsibility should be assigned and a budget established for the lowest level deliverable identified in the WBS.

Once the WBS has been established and owners assigned the individual deliverables can be broken down into verbs that describe specific tasks. These tasks should take no more than 80 hours to complete. Taking the deliverable to the task level enables you to establish a project schedule.

The WBS development process is an iterative one. It is completed as a project team effort and reviewed and updated as part of the project life cycle. Specific major steps should be followed during the development of the WBS. Starting with the high-level WBS developed in the Initiation Phase; follow the steps as described below.

<b>WBS Development Procedures</b>	
Review project goals and	Ensure that the project team fully

objectives.	understands the project goals and objectives.
Prepare summary WBS down to activity level.	<p>Perform a team review of the project definition and initial project plan for:</p> <ul style="list-style-type: none"> <li>▪ Project phase and activity</li> <li>▪ Milestones</li> <li>▪ Deliverables</li> </ul> <p>Adjust, add, and delete project activities as needed.</p>
Determine additional level of detail needed.	<p>Determine how much detail is needed to understand task performance requirements.</p> <p>Determine the level of detail at which project tracking will be performed.</p> <p>Establish the level of detail of the WBS structure to match the project's requirements. For example, one level below that at which tracking will be performed.</p>
Assign specific sections for further breakdown.	<p>Assign to project team members the responsibility of breaking down deliverables to lower level WBS elements.</p> <p>Assign responsibility for developing the work packages to those team members who will perform the work.</p>
Define WBS task and subtask details.	Prepare WBS task and subtask element descriptions, as they are developed.
Review WBS with project team.	<p>Conduct a team review of the project structure created.</p> <p>Finalize the WBS elements.</p>

a. Detailed Work Breakdown Structure Process

The WBS is the heart of project planning on which many disciplines rely. The WBS is used as the basis for creating:

- Responsibility matrix
- Schedule
- Cost
- Quality plan
- Communications plan
- Risk assessment
- Procurement plan

The development of a detailed WBS is the effort of the entire team during the detailed planning meeting. It is imperative to use the knowledge and resources of the team. The WBS development as a team helps to establish team member's roles and responsibilities for the duration of the project and reinforces the reason each individual has been allocated for this particular project. The WBS is one of the most valuable tools for acquiring ownership of the project by the team. If the project budget is limited, ensure that there are funds allocated for this planning session. There is not a better way for the project manager to gain commitment and buy-in to the project for the team as a whole. For this reason the WBS is considered to be the basis for all planning.

b. General Guidelines for WBS

- All project objectives are made up of deliverables
- WBS defines products not tasks
- Sum of all the deliverables produces the final project solution
- One WBS level's output is an input to the next higher level
- If you break down a deliverable, it must be broken into at least two deliverables
- Same deliverable cannot be in two different places in the WBS
- Lowest level deliverable is called a work package with work effort of 80-150 hours
- Deliverables are represented as nouns
- Tasks are identified at the work package level not to exceed 80 hours
- Tasks are represented as verbs and usually not nouns

c. Creating the WBS

Gather your team into a "war room" or a room that has plenty of wall space. Make sure everyone has access to:

- Post-it-notes
- Markers
- Colored dots

- Pen and paper
- Flip chart paper

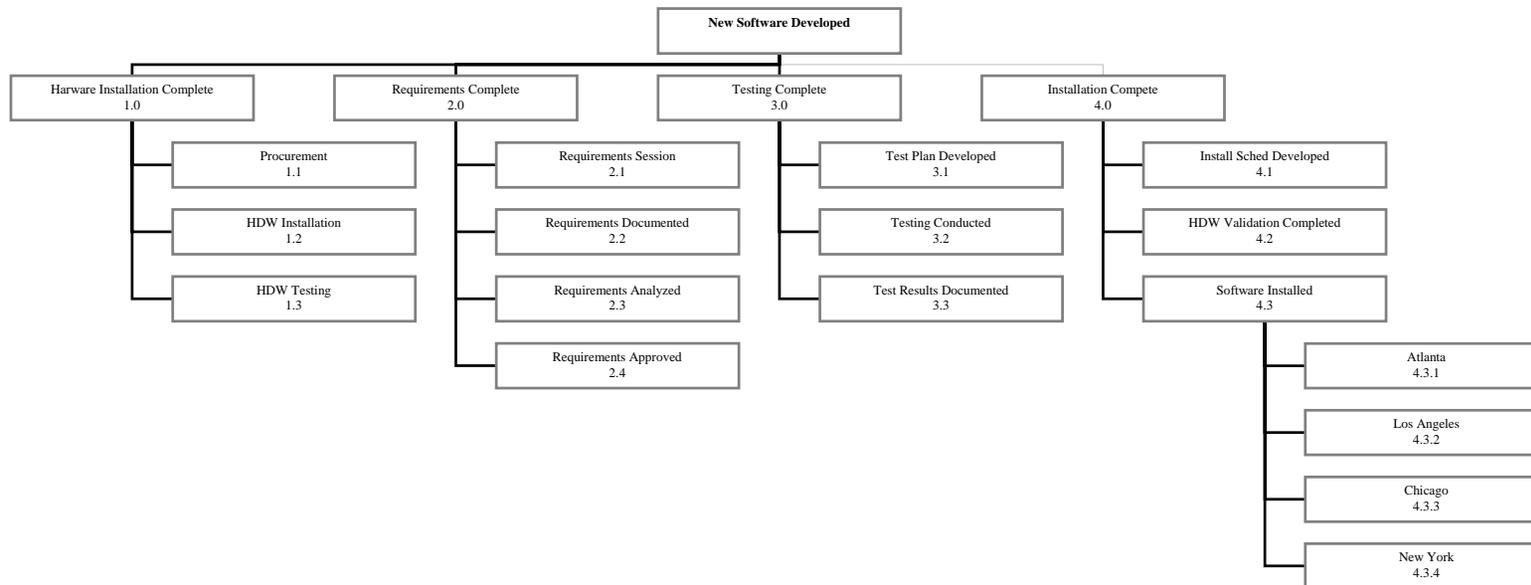
Use the following steps to guide the team through the development process:

Steps	Preparation	Tasks
1	<p>Assign two recorders to write on post-it-notes with markers, one deliverable per post-it.</p> <p>Tape project requirements and high-level charter WBS on wall.</p>	<p>Discuss requirements for project.</p> <p>Encourage entire team to participate in brainstorming session.</p> <p>Have recorders alternately list one deliverable per post-it and place on wall – take all contributions.</p> <p>After 10 minutes of brainstorming, arrange and rearrange the deliverables into hierarchical categories.</p> <p>Note each highest level deliverable and brainstorm to see if additional deliverables can be added.</p> <p>Break down into the lowest level deliverable (work package) 80-150 hours.</p>
2	<p>Demonstrate coding structure.</p>	<p>Code each deliverable using a standardized corporate coding system.</p>
3	<p>Set-up computer with project management software tool.</p> <p>Assign someone to input information.</p>	<p>Record WBS into project management tool.</p>

Steps	Preparation	Tasks
4	<p>Distribute colored sticky dots.</p> <p>Assign one color per person.</p> <p>If not enough colors, place marks on dots to differentiate.</p> <p>Make “color coded key”.</p>	<p>Request that each team member place their colored dots on the “work packages” for which they will be responsible.</p> <p>Ensure that each work package has an owner.</p> <p>If a work package does not have an owner, assign one.</p>
5	<p>Explain the difference between work effort and duration.</p>	<p>Have each owner assign work effort for each work package.</p> <p>Add all the work effort totals to calculate high-level work effort estimate for project time line.</p>
6	<p>Develop Tasks.</p> <p>(Note: Tasks are not typically identified during the detailed planning meeting, due to time constraints. It is more important in this meeting to completely identify all project deliverables. For more information on developing tasks, see the Schedule Preparation section of this chapter.)</p>	<p>Give each deliverable owner a copy of the <a href="#">Developing Tasks Worksheet</a> (Appendix B).</p> <p>Have them return to their workplace and breakdown each lowest level deliverable they own into its respective tasks.</p> <p>Be sure to identify the date that the Task Worksheets need to be turned in. These will be used to develop the project schedule.</p> <p>When developing tasks, be sure to include duration in days and estimates in hours.</p>

d. Presenting the WBS

Once the entire WBS had been developed and tasks have been entered into the scheduling tool, the project manager should also develop a visual representation of the WBS. Keep in mind that the WBS does not include tasks. It only represents those deliverables that must be produced in order to complete the total solution. Managers and project owners are mostly interested in what needs to be produced, (deliverables) and not so much in how it is produced (tasks). For this reason the project manager will develop a visual portrayal of the WBS using a tool such as Microsoft Visio or PowerPoint. Below is a sample of what a WBS would look like using Microsoft PowerPoint.



### 3. Develop The Responsibility Matrix

**Purpose:** The [Responsibility Matrix](#) is a matrix that contains the description of the deliverables of the detailed WBS with each deliverables code of accounts (identifying number) and the owner or person taking responsibility for managing that deliverable. This matrix is used during the project execution and controlling phase to locate, track and establish status for each deliverable. This matrix is used by the project manager as well as the project team.

There are four basic responsibilities contained in the Responsibility Matrix.

- **Owner** - It is not essential for the owners to do the actual work. They are responsible for seeing that all the tasks are completed on time, within budget, and meeting performance requirements. The owner may also create their own responsibility matrix for their project team if they own many deliverables and manage a sizable sub-team
- **Reviewer** - This person is responsible for interim review of deliverables in progress. Additionally, they may interface on issues affecting the quality, cost, or timeliness of producing the deliverable. They also determine when the deliverable is ready to proceed through the approval process
- **Approval** – This person, usually someone from the project sponsor has the authority to approve the final deliverable and will most likely intervene in issue resolution concerning that deliverable. This approval usually indicates acceptance by the project sponsor that the deliverable meets the requirements and quality standards set forth in the Project Charter.
- **Last Word** – Regardless of approval levels, most organizations have a senior representative that can “veto” or overrule an approving authority. This type of action usually occurs very seldom and is typically tied to a change of business strategy. It is important, however, for the project manager to identify who this person is and understand their role in the project.

The Responsibility Matrix enables the project team to understand the responsibility structure for each deliverable in the project. Another purpose of the responsibility matrix is to ensure that all deliverables are assigned which helps eliminate any duplication of efforts. It creates accountability and ownership of the deliverables assigned. Distribute a copy of this report to any person named on the Matrix and resolve any conflicts that may arise. The Responsibility Matrix also helps to establish that all functional areas are accounted for within the project.

### 4. Develop Communications Plan

**Purpose:** The Communication Plan is one of the supporting knowledge areas needed for project success. It is often one of the areas that is most often neglected or taken for granted by the project manager and project team. This part of the planning phase is critical for implementing an infrastructure for tracking and controlling the project during the entire project life cycle.

Communication throughout the project is critical to project success. The project manager should be the central point of communication for all project related information exchange. During project initiation, it is important to establish a communication network that is based on the project owner's expectations to meet this objective.

The project manager develops guidelines for all information created as part of the overall [Communications Plan](#) (Appendix B). Consistency among project team members requires guidelines for the information created and distributed. The format, style and quantity of information to be implemented during the life of the project should be well defined. Project managers should edit the Communication Plan to develop a comprehensive understanding among team members on how the team will communicate.

Another very important aspect of communication is the interaction among the project team members, owner(s), and other project stakeholders. Situations arise where communication among project stakeholders is needed, including participation on users groups, advisory teams, and in newsletters. The project manager must understand the importance of communication to the success of the project and create an environment in which communication is encouraged and accomplished. The following sections describe components of well-defined communications plan.

a. Define Communication Technology

There are many ways of communicating information throughout a project. Various methods may be used on the same project. The project manager will define the technology required for all project communications. Different communications will require different technologies and it is the project manager's job to define the communication requirements. This enables consistency among all project stakeholders. Communication technology utilized by the project stakeholders and management may include e-mail, fax, shared network drives, Intranet or other available inter-office communication. Regardless of the technology chosen, the project manager must ensure that all project team members can access and use the selection. Understanding of the communication technology assures consistency among the project team.

b. Develop Team Organizational Structure

**Purpose:** The Project Team's Organizational Structure can be represented in an organizational chart of the project. This chart is representative of who is on the team; functional areas represented, stakeholders, project manager, project team, project sponsor and or project champion. The reason this is needed for each project is that during the project, given the cross-functional and geographically disbursed team members, it allows for clear communication and escalation of project needs.

Once the project team has been defined and the high-level WBS has been developed, the project manager will develop the project team organizational

structure. The project manager must determine the project team members and the functional department and manager to whom they report. The project manager should create the project's organizational structure to provide a means of communicating the reporting relationships throughout the project life cycle. Use the Organization Charting function found in Microsoft Word to develop the Organization Chart. See the [Organization Chart](#) for a sample Organization Chart.

c. Develop Project Directory

**Purpose:** The Project Directory is used for communication between team stakeholders and allows for new team members to be able to identify the necessary contact information for project efficiency.

Once the project team (the "core" team) has been assigned, the project manager will develop the [Project Directory](#). The purpose of the project directory is to provide an easily accessible document containing project stakeholder contact information. A project directory includes all project team members. Be sure to include items such as email, cell phone, or pager information. The Project Directory must be updated in a timely manner to keep it as an effective communication tool.

The project manager will develop, at a minimum, a Global Distribution List. The list should contain all necessary contact information for each person involved in the project. Be sure that any team members external to the organization are given appropriate access to this list. The project manager should print a copy of each member record and provide this copy to each member that does not have access to the Global Address book.

d. Develop Communication Matrix

A [Communication Matrix](#) (Appendix B) detailing the information recipients and the communication methods (memos, verbal, e-mail, meetings, etc.) will be developed by the project manager. The communication matrix contains the individuals or groups involved with the project and the types of information required. The purpose of the communication matrix is to ensure the creation of proper information and the accurate and timely distribution to the appropriate parties. The method of communicating (verbal or written) will also be defined in the communication matrix. Regardless of the communication methods selected, the project manager must ensure all team members are trained and have access to the chosen method. To complete the Communications Matrix, follow these steps:

- Enter the recipients. Groups are already entered, but the project manager may need to add specific individuals.
- Enter the report or meeting title. Again, a select set of documents, reports, and meetings are already entered. Edit the matrix to add or delete any that do not apply.

- Indicate the method and frequency for each title next to the name of each recipient.
- Be sure to update and redistribute the Communications Matrix as additions/changes occur

e. Meeting Management

Meetings are an important form of communication among project teams. Types of meetings include:

- Detailed planning meeting
- Regular status meetings
- Management review meetings

Typically the project is started with a detailed planning meeting to set the stage for final development of the project charter and the WBS, as described in the Initiating Phase section.

The project manager will have planning meetings during this Phase to develop the project plan that includes the schedule and various plans.

Once the project has been planned, the project manager will conduct **regularly** scheduled status meetings. These meetings will inform the project manager and project team of the project status, surfacing issues, and updating action items.

<b>Status Meeting</b>	
Purpose:	The purpose of the status meeting is to review project progress, address any issues, and obtain feedback from project team.
Attendees:	All Project Team members  Project Manager  SME's (if applicable)
Agenda:	Start with accomplishments to date (milestones, ahead of schedule, etc.)  Get status and progress from each team member.  Identify and address any issues and assign responsibility for resolving.  Summarize the status meeting to ensure project team has same understanding.

<b>Status Meeting</b>	
Location:	Conference Room suitable for the topics and attendees. Do not schedule a room that is not compatible to hold all attendees or one with no wall space to post flip charts.
Limit:	One hour (may be longer or shorter depending on the project). Start the meeting on time and follow the agenda.
Meeting Minutes	The project manager should assign a team member to take the minutes. This position may rotate. The project manager will type the minutes from the notes and distribute via e-mail within 48 hours of the meeting.

The project manager will also conduct management review meetings with the project owner. During the management review meetings, the owner will decide to continue the project and/or make changes as necessary. These meetings will provide the project team with continual awareness of changes in owner requirements as well as regularly communicate the project's status to the owner. They will also promote owner awareness of issues and constraints the project is encountering. Bad news does not get better with age.

<b>Management Review Meeting</b>	
Purpose:	The purpose of the management review meeting is to review project progress, address any issues, and obtain approval and go-ahead from the project owner.
Attendees:	Project Manager Project Owner
Agenda:	Project status  Outstanding issues  Completed milestones  Next expected milestone  Actual progress vs. baseline

<b>Management Review Meeting</b>	
Location:	Conference Room or Owner's Office
Limit:	One hour (may be longer or shorter depending on the project owner's comments).
Meeting Minutes	The project manager should take notes during the meeting. The project manager will type the minutes from the notes and distribute via e-mail or memo within 48 hours of the meeting.

Other specially scheduled meetings held throughout the project include technical reviews, design reviews, interim project reviews, and budget reviews.

Once the project has been completed, the project manager will conduct a post implementation review with the project owner to discuss any outstanding issues and ensure owner satisfaction.

#### f. Issues and Action Item Management

The project manager should introduce the Issues and Action Items process to the team. Issues are defined as any problem that will impact the team's ability to deliver a solution on time and within budget. Issues will be tracked and managed through an [Issues Log](#). The [Action Item Log](#) is used to document any administrative tasks that must be completed but that do not qualify as issues or tasks to the project plan. Examples of Action Items include reserving meeting rooms, or having reports printed for a meeting. These logs need to be explained to the team and utilized during planning until closeout.

#### g. Status Reporting

Even though status reporting is accomplished during the Execution & Control Phase, it is important for project managers to determine specific reporting requirements early in the planning process. Reporting provides project stakeholders with information regarding how resources are being utilized to accomplish the project objectives. The project manager will provide regular status reports, progress reports, and forecasts (additional resource requirements, estimates to complete, etc.). The project manager must ensure that the team members are aware of what information is needed, in what format, and by when. This will facilitate the accurate and timely production of reports.

Status meetings are held regularly to report on progress and issues encountered. Several types of reports may be used to communicate the overall status of the project.

- Variance reports compare the actual results to the project plan baseline. Cost and schedule variances are the most common variance reports generated. A trend analysis studies project performance over time to determine if performance is improving or declining
- Performance reports organize the collected information and analyze the results. Typical formats for performance reports include Gantt charts, S-curves, histograms, and tables.

Status reports should be tailored to the specific need of the project. The project manager can use the templates provided as a baseline for creating custom reports.

#### h. Prepare the Project Documentation

A Project Notebook must be created by the project manager as a repository for the various documentation generated during the project's life cycle. The notebook must include tabs for inserting project information produced throughout the project life cycle. The project notebook will include, at a minimum:

- Project Charter
- Communication Plan
  - Organization Chart
  - Communications Matrix
  - Issues and Action Items List
- WBS Baseline Schedule and Cost & Current Actual Schedule and Cost
- Responsibility Matrix
- Scope Change Log
- Current Status Reports (Archive past reports as needed)
- Risk Management Plans
- Other Project Documentation as needed

In addition to the Project Notebook, the project manager will set up the project files (both electronic and manual as appropriate) according to the needs of the project. Use the [Project File Checklist](#) (Appendix B) to determine the files that need to be established.

Much of the project documentation will be stored on a shared network drive. It is critical that the project manager actively control and manage access to this drive.

### 5. Risk Assessment and Management Planning

#### a. Identify risks

Risk identification involves brainstorming the possible threats to the project. The project manager is responsible for having the project team assist in identifying these risks.

## b. Risk Assessment

The **probability of occurrence** is the degree of belief that various events or effects will occur. For each risk that is identified, there must be a determination of how likely it is that the risk will happen. A cardinal (1 - low to 10 - high) or ordinal (high, medium, low) scale may be used.

The potential severity of impact or **consequence** determines the significance of the risk. This is an assessment of how great an impact the event will have if it happens. Quantitative methods might include monetary costs or time estimates that can be associated with the impact. Qualitative methods may be simply high, medium, or low estimates. The cardinal and ordinal scale would be similar to those used for probability.

The project manager should organize and prepare for a risk meeting that is separate from project detailed planning meeting.

To begin, the project manager should prepare and distribute the assessment agenda. In planning for this meeting, be sure to allow at least four hours. The project manager should also identify a separate facilitator since the project manager will actively participate in this meeting. Senior management should not participate in initial risk assessment meetings so the project team is not inhibited to openly discuss and assess all risks and impacts to the project.

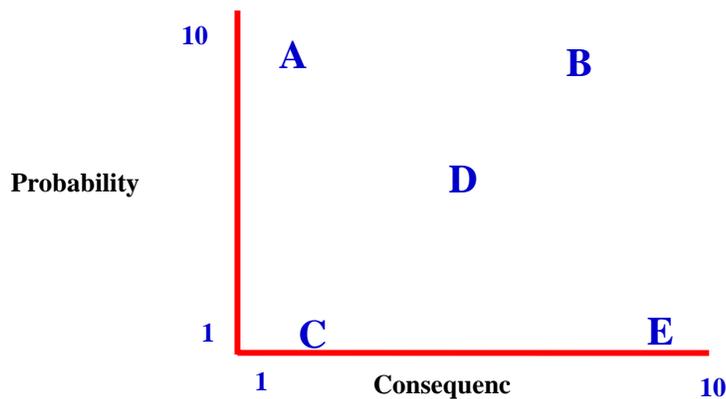
Before the meeting, make sure the following items have been arranged or prepared:

- Meeting room
- Overhead projector
- Computer with a spreadsheet program
- Agenda distributed at least two days in advance
- On the day of the meeting, list the risk attributes separately on flip chart paper and post around the room.

Kick off the risk meeting with a review of the project charter and any critical issues, milestones, or assumptions that have already been determined. In addition, describe the attributes listed on the flip charts to encourage participants to begin thinking of possible risks. Because this initial risk meeting is used to gain feedback from the entire team, it is important to make sure each participant feels unrestricted in identifying and assessing any risks. Once you have set the stage for the meeting proceed as follows:

- Have each participant go around the room listing risks on each of the attribute flip charts posted before the meeting.

- Have the recorder enter each risk listed into a [Risk Planning Spreadsheet](#) organized by attribute.
- Each participant is given a printed copy of the spreadsheet and asked to rate from 1 to 10 (1 – low to 10 – high) the probability of occurrence and the consequence if the risk event occurs.
- Collect the sheets and enter them into the spreadsheet so an average score can be obtained for both the probability and consequence.
- Plot each risk, based on the average probability and consequence on a graph as follows:



- Review the results with the team to gain concurrence on each risk. Where significant differences occurred in individual scoring, discuss in detail the reasons for the difference.
- Next, prioritize the risks as a group from the most important to the least important. Assign ownership to each risk.
- Select the top 5 – 10 priority risks (depending on the total number.) Enter these risks into the [Risk Priorities List](#). These risks will have detailed plans developed that will help you manage the consequence of the risk. For all of the other risks, detailed plans will not be developed, but they likewise must be reviewed periodically to ensure they do not become a higher priority risk.

Adjourn the meeting with clearly defined deliverables, with completion dates, that will result from the development of the risk plans for the selected top priority risks. Owners should develop the risk plans using the [Risk Management Plan](#).

#### c. Develop Risk Management Plans

The assigned owners will develop detailed Risk Management Plans, which include mitigation strategies and contingency plans, on the highest priority risks. Not all risks warrant a mitigation strategy. Depending upon the probability of occurrence, potential losses and frequency, and/or time available for planning, the project manager and team members will decide if a mitigation strategy is necessary.

The prioritized risk list is used as input into developing a risk strategy. There are four basic risk strategies:

- **Risk avoidance** is eliminating the risk threat. An example would be planning a company picnic. The threat of rain is a risk if the event is held outside. One way to avoid this risk is to hold the event indoors or under tents.
- **Risk mitigation** is determining how to decrease the probability of the risk and/or reduce its impact. Risk mitigation involves lessening or reducing the probability of a risk event, its impact, or both.
- **Risk acceptance** is understanding the risk and accepting the consequences should the risk occur. An example would be accepting extended project duration due to resource availability.
- **Risk transfer** is shifting the risk to someone else. An example would be hiring a subcontractor to handle toxic waste rather than exposing the company's employees to the hazardous materials.

A **contingency plan** for a risk event is the identification of steps that will be accomplished if the risk strategy is implemented. The steps will be included in the project's schedule and cost baselines. Make sure the WBS reflects the deliverables required by the contingency plan.

Use the [Risk Management Plan](#) to develop detailed Risk Management Plans. The template is designed to provide a comprehensive assessment of each risk and the mitigation/contingency plan in the event the risk occurs. Once the Plan has been developed the project manager will consolidate the plans and ensure any needed deliverables are added to the WBS.

d. Obtain Risk Management Plan Approval

The project manager is responsible for reviewing the Risk Management Plan with the owner and obtaining the owner's approval. During this meeting, the project manager must be clear on what risks are associated with the project and the impact if they occur. The project owner must understand the costs in terms of dollars, quality, and timeliness that risks have on the project.

## 6. Define Human Resource Skill Requirements

Successful project management, regardless of the organizational structure, is only as good as the individuals and leaders who are managing the key functions. Project management is not a one-person operation; it requires a group of individuals dedicated to the achievement of a specific goal. Project management includes:

- A project owner/sponsor
- A project manager
- An assistant project manager (backup)
- A project office

- A project team

Generally, project managers are assigned full-time to the project and work out of the Project Management Office, whereas the project team members work out of the functional units and may spend only a small percentage of their time on the project.

Five basic questions should be considered before the staffing function begins:

- What are the requirements for an individual to become a successful project manager?
- Who should be a member of the project team?
- Which member of the project office is assigned to the project?
- What problems can occur during the recruiting activities?
- What can happen downstream to cause the loss of key team members?

In some situations where constant streams of projects are necessary for corporate growth, the staffing problems become very complex, especially if the organization is understaffed. Use the [Project Staffing Request](#) (Appendix B) to ensure effective communication and management commitment to providing qualified staff.

The staffing requirements are in addition to the project team members assigned during the initiating phase. The acquisition may be both internal and external to the company. The resources identified are more skill related; for example the project may call for a C++ programmer or a technical writer. The project manager must acquire (either internally or externally) these resources to carry out specific project tasks.

After determining the preferred project staff, negotiation skills are essential in acquiring the desired project staff. The project manager will negotiate with functional managers for the use and availability of their employees. Changes in resource requirements will occur during the project and may cause availability problems. The project manager will have to negotiate with the functional managers for extended resource availability based upon project priorities.

Negotiations between the project manager and the owner/management will occur if the project manager concludes that hiring external personnel will provide more suitable qualifications to perform project tasks than internal candidates. If outsourcing is necessary, contact the Human Resources Department for assistance.

## 7. Schedule Preparation

### a. Determine Calendars and Time Constraints

The project manager is responsible for determining the project calendar and time constraints that exist. The project calendar is used to specify both working and non-working days including company holidays and weekends. The project calendar is used for the overall project. However, the project manager may develop individual resource calendars for the project team to address vacation

time, individual schedules, and team member availability (if not available full-time for the project).

Time constraints include any predetermined milestone or completion date, resource time constraints, and resource availability. The project manager must determine the calendar and time constraints before the schedule can be developed.

#### b. Develop Task List

A task is the lowest level of work defined in a project. Task list development is the process of identifying all the tasks that must be accomplished in order to complete each of the lowest-level deliverables. It closely follows the lowest levels of the work breakdown structure to ensure that all areas of the project have been covered and that the deliverables will be as specified in the project charter.

Once all of the deliverables have been entered into the scheduling tool, the tasks are then entered. Each of the deliverable owners were asked to develop detailed tasks lists for each of the deliverables they own. This was done at the end of the detailed project planning meeting. The project manager should now have collected all the Developing Tasks Worksheets from the deliverable owners.

There are two rules to always follow when developing a task description:

- A description of the task should contain no more than fifty characters. This is a general limitation for producing Gantt charts and fitting the task description on a standard page. If more detail is necessary, use the note area in the scheduling tool.
- Always use a format with a verb first and then a noun. Using verb first forces an action to be established for the task. Examples: Develop Communications Plan; Obtain Approval; Produce Reports, etc. Remember, deliverables are nouns and tasks are verbs.

Having collected the [Developing Tasks Worksheets](#), the project manager should now enter all of the tasks into their Microsoft Project schedule.

#### c. Task Estimates

One of the most important processes of the project plan is that of estimating the time involved in completing each task. These estimates are being made at a time when many variables of the future are unknown. Some of the pieces of information that should be used to make the best estimate are:

- **Effort** is defined as the total number of hours that will be expended on a task. For example, if two people work 5 hours each, then the total effort for that task is 10 hours.

- **Duration** is defined as the total number of calendar days that it takes to complete a task. For example, if the same two people spend 10 total hours working on a task that they start on Monday and end on Friday, then the total duration for that task is 5 days. Duration is affected by resource availability, waiting time for deliveries, or other interruptions in the constant flow of work hours to complete a task. Never assume that 8 work hours equates to 1 duration day.
- **Resource Requirements** - The project team will determine what types of resources are needed and how much of each one are needed to complete the activities defined in the WBS. The duration of any task is usually influenced by the amount of resources assigned to it.
- **Resource Capabilities** - The duration of most projects will be influenced by the quality of the resources assigned to them. Individuals who have worked on several similar projects previously would generally be expected to complete an assignment in less time than new personnel do with little experience in project work.
- **Historical Information** - Many tasks of a project may have been performed before, either by the project team, other members of the organization, or by outside entities for which information may be available. Some sources which should be utilized are:
  - Project files: Previous project teams or project members may have records that would help in estimating duration times for tasks in a new project.
  - Commercial duration estimating databases: These databases may be helpful in obtaining durations for tasks that are common to many different applications, such as characteristics of different wall coverings.
  - Project team knowledge: Members of the project team may have been involved in a similar project and may have direct experience with task durations.

The deliverable owners in the Developing Tasks Worksheet should have provided durations and effort estimates. Use this information to initially set up the project estimates. Once all of the information is in Microsoft Project, the project manager will be able to determine the overall accuracy of the information provided.

#### d. Sequence Tasks

In order to develop a schedule for the project, a project manager must determine the inter-task relationships. Determining the sequence in which the tasks must be performed, identifying the number of tasks that can be underway at the same time (called parallel paths), and identifying the dependencies is called Task Sequencing. Task sequencing and inter-task relationships should be developed during planning meetings with the team members responsible for each area of work. There are generally three types of dependencies that are necessary inputs

to sequencing: mandatory (hard-logic), discretionary (soft-logic), and external (either hard or soft-logic), and each is discussed below.

- **Mandatory (hard-logic)** – This dependency includes relationships that require something to happen before another can begin. For example, hardware must be installed before the software can be installed. The project manager cannot change this relationship.
- **Discretionary (soft-logic)** – This dependency includes relationships where the project manager has discretion regarding when a subsequent task can begin. For example, in software development projects, some plans call for software installation to be complete before training documentation can begin. In reality, there is probably some element of training documentation that can begin even before the software is installed.
- **External (either hard or soft-logic)** – This dependency can be either mandatory or discretionary. External dependencies are those relationships to tasks outside the scope of the project. In companies where multiple software development projects are in progress simultaneously, tasks among separate projects may be dependent on each other.

The sequencing of tasks is the heart of schedule development. Sequencing will establish logic and will drive the schedule dates of the tasks. If logic is not used in the schedule and arbitrarily force start and finish dates on tasks, and then a simple spreadsheet should be used to schedule your project. Logic is the most important and complicated input to the planning process. Logic actually creates a modeling of the project to produce a forecast of the future. The logic forces the project manager to plan how work on the project will be accomplished.

All projects should have a 'start' and 'finish' milestone. Other milestones will be inserted in the logic for clarification of major accomplishments. Limit the number of 'start-to-start', 'finish-to-finish', and 'start-to-finish' relationships because of the difficulty in understanding the logic. Lag and lead times for dependencies may be used.

To develop an accurate logic diagram always ask the question: **What do I have to complete before I can start this task?** Do not ask the question, "What do I do next?"

When developing the project schedule in Microsoft Project, use milestones to indicate critical dates or to indicate the end of significant deliverables. All dependencies should be task to task or task to milestone. Watch out for floating tasks called **floaters**. These are tasks that end prior to the end of the project and are not predecessors to any subsequent task or milestone. There should only be one floater per project - the *Project Complete Milestone*. Once you have completed all sequencing, go to the custom "Floater Highlight View" of Microsoft Project that will identify all floaters. Correct all floaters by linking them to their successor task or milestone.

#### e. Determine Task Resources

The project manager, with the assistance of the project team, will determine which resources will be responsible for completing each task. There are a few rules that must be followed:

- Responsibility assignments must be made to all tasks.
- The project team member(s) assigned must accept the responsibility.
- The assigned project team member will provide the project manager with all time, resource, and cost estimates and provide update information.
- The project team member assigned must provide the activity duration estimate, planned work effort, and report to the project manager the update status.

#### f. Develop Schedule

Once the project manager has determined the project calendar, task list, resources, durations, and sequence, the schedule can be developed. The project manager will enter the start date for the project and the scheduling tool will calculate the duration of the project based on the information entered. The project manager should level the resources to ensure they are not over allocated for any particular day.

The calculation of the schedule, the critical path, major milestones, and date of completion must be verified that they are logical and within the time constraints of the project. A critical path is the path(s) throughout the project with the longest duration or the one(s) with the least amount of float. Float is the amount of time an activity may be delayed from its early start without delaying the project completion date. The critical path tasks must be verified. Does it make sense for certain tasks to be on the critical path? This is a reality check. Also, the dates on major milestones and project completion date must be checked to see if they are within the constraints from the owner.

The project manager, with the consensus of the project team, will coordinate all changes to the schedule. All schedule changes that are affected by scope change will be documented through the scope change control. The Gantt Charts in the scheduling tool will compare the actual dates to the established baseline dates. The project manager will develop the exact control procedures for all schedule change control.

### 8. Develop Cost Management Plan

#### a. Determine Project Cost Status

The project manager is responsible for monitoring cost versus project progress to assure the project is completed within budget or to identify problems that may prevent satisfactory completion within budget. This task may be performed directly by the project manager or the duties may be assigned to another member of the team. Regardless of responsibility, the cost information routing

needed to perform this function should be established and kept current via copies of labor expenditure reports, purchase requisitions, purchase orders, invoices and stock requisitions. At the beginning of the project, the following items need to be addressed by the project manager to determine the status of the project from a cost perspective:

- Is the project Operation & Maintenance (O&M) or Capital?
- Has a cost code been assigned?
- Is the project budgeted?
- If budgeted, what is the budget for current and future years?
- Will the budget, if one exists, support the project scope?
- Have funds already been expended on the project?
- What types of reports are available for the project?
- Who is the best person on the team to obtain/interpret the reports?
- Are there special report needs that do not currently exist?

b. Identify Project Cost Components

The basic components that make up the total cost of a project are:

- **Company Labor** - This charge results when any employee charges time on their time sheet to the unique project account code.
- **Overhead** - This charge is based on the employee's time charged to company labor. It is pre-calculated percentage added to company labor to cover the cost of employee benefits. This percentage should be adjusted each year. The project manager should consult the Accounting Department for the current percentage and further detail as needed.
- **Material** - This charge results when standard stock material is obtained from the warehouse supply using the unique project code. Non-stock items are charged when they are received by the warehouse and transferred to the user via a stock requisition form. This information is updated nightly. The project manager should be included in the approval routing for all project material purchases requiring a purchase order.
- **Direct Business** - Travel, training, food and lodging are examples of charges that fall into this category. All expenses (except mileage) associated with employee expense account are included. The project Manger before payment should approve reimbursements charged to the project's account code.
- **Outside Services** - These costs result when any non-employee charges time to the project via a supplier invoice. These charges may be a small part of a large invoice but will be identified by the cost code. The project manager may also have a unique purchase order number issued specifically for the project

that the project manager will receive invoices against. In either case, the project manager should review all invoices resulting in charges to their project for accuracy and comparison to the budget.

- **Company Services** - These costs result from charges from other departments in support of the project. An example would be graphic artwork done "in house".

The project manager should create a simple spreadsheet to track total costs for the project. The largest portion of most project costs is associated with labor. For this reason the resource table in Microsoft Project should reflect as accurately as possible the hourly rate for any project resource. Contact the Accounting Department for assistance in determining labor costs.

## 9. Measuring Quality

Quality is one of the most important aspects of project management. It should be inherent in everything that is produced. If the project manager waits until the end of the project to determine if the quality was met, then it is too late to make corrections that could have been identified earlier on. Quality is measured in a variety of ways. For example, a good requirements gathering and software testing program ensures quality as the project progresses. Phase sign-off at the end of critical deliverables help ensure quality before progressing to the next phase or deliverable.

A quality management plan describes how the project management team will implement its quality policy. It will not only address the quality requirements of the project but must also address the policy and procedures of the existing corporate quality plan reviewed during the Initiation Phase.

When developing a quality management plan, some questions to ask are:

- What is a quality review?
- What does conformance to requirements mean to the customer?
- What are the quality objectives?
- What procedures and processes must be followed?
- When should quality reviews be held?
- Who should attend the quality review meetings?
- Who should not attend the quality review meetings?
- Who should organize the quality review meetings?

The quality of the product includes the following:

- Objectives (performance)
- Monitoring and acceptance criteria

The quality of the product must meet or exceed all of the project's objectives as stated in the project charter. If the objectives are met, the quality of the product is

achieved and the owner and users will be satisfied. Developing specific, measurable, and time-framed objectives will help create a quality plan that is quantifiable.

Quality audits will be performed periodically throughout the project life cycle to verify processes and procedures are in compliance. Quality must be incorporated into the project processes. It is always easier to do it right the first time than have to rework the process. Simply because a projects processes were adhered to does not guarantee product compliance. However, the more detailed quality management plan in place increases the likelihood of conformance.

Quality review meetings may be scheduled periodically to review and make corrective adjustments to the project. The standard meeting agenda template should be used and should include the following:

<b>Checklist for Quality Review Meeting</b>	
<b>Introduction</b>	<ul style="list-style-type: none"> <li>▪ Complete known parts of a review summary form.</li> <li>▪ Make introduction.</li> <li>▪ Give overview of presentation</li> </ul>
<b>Review</b>	<ul style="list-style-type: none"> <li>▪ Present material regarding quality status.</li> <li>▪ Respond to issues.</li> <li>▪ Record defects, suggestions, and questions.</li> </ul>
<b>Conclusion</b>	<ul style="list-style-type: none"> <li>▪ Collect materials, notes, etc.</li> <li>▪ Agree on corrective actions.</li> <li>▪ Update review summary.</li> <li>▪ Review decisions</li> <li>▪ Set follow-up review date (if applicable)</li> </ul>

The project manager may select one project team member to be quality manager. The quality manager will monitor the product to ensure compliance and report results to the project manager.

The project owner is responsible for approving the acceptance criteria, as well as approving any changes that are to be implemented. The owner also sets the standards for quality.

Quality management of the project includes the following:

- Checklists
- Quality Reviews

- Reporting
- Communication
- Project Plans - change control

Checklists ensure that the project plans are complete and eliminate the omission of items.

As needed, project manager will create and distribute reports that are relevant to the quality management of the project. These reports include the project status report and meeting minutes.

Satisfaction must be measured throughout the project. Owner, user, and team member satisfaction are essential to the quality of the management of the project. The owner must believe the project is running smoothly and well managed. The users must have confidence that the deliverable will provide the expected benefits. Team member satisfaction is equally important to project quality. The team must feel empowered, challenged, and believe their efforts contribute to the success of the project.

The project manager will conduct status updates and owner review meetings. The status update meetings must be timely, follow the agenda, and have documented meeting minutes.

The project manager will monitor project statistics including time, cost, and resources and compare to the baseline. Actual start and finish dates will be compared to the baseline dates to determine schedule variances and task on-time statistics. Actual costs versus budgeted costs will be compared and the cost variance will be determined. By comparing the statistics with the baseline figures the project manager can gauge how the project is doing in accordance with the project plan. The project manager will monitor all changes to ensure that the change control processes are being followed and that the project plan is being updated accordingly.

## 10. Project Procurement Management

### a. Procurement Planning

The project manager is responsible for acquiring goods and services from external sources. The initial step is to define the project requirements by considering the following:

- Is the project strategically aligned with the goals of the organization?
- Develop the statement of work (SOW), specifications, and WBS
- Determine whether the requirements can be made or bought and analyze the costs associated
- Analyze the schedule and major milestones

- Calculate costs
- Obtain approval and authorization to proceed

## Procurement Planning Components

Procurement planning is the process of identifying which project needs can be best met by procuring products or services from outside the performing organization.

This involves consideration of

- Whether to procure
- How to procure
- What to procure
- How much to procure
- When to procure

Once it is determined to procure the product or services then the project manager, working with the procurement department (when applicable)

- Select a supplier
- Arrive at a proper price, terms and conditions
- Issue a contract or order
- Ensure proper delivery

## Buyer Contract Planning Approach

Once the project requirements are determined and the decision is made to purchase from outside the organization, a contractor WBS (CWBS) will help define what the deliverable expectations are and will provide for bottom-up cost and schedule estimates and risk analysis.

The CWBS is used for developing the list of contract deliverables, the specifications or state of work and the analysis of contract uncertainties. This needs to include both technical and administrative performance elements – analysis of all sellers' obligations to the buyer. Other things to consider: quality, shipping contract administration, documentation and reporting.

The next step is to prepare for source selection and contract formation procedure. The following decisions need to be made:

- Competitive bidding or negotiate with single source?
- Sealed bidding or competitive negotiations?

- If competitive negotiation
  - Who should participate in the evaluation panel?
  - What criteria should be used for the evaluation?
  - What will be included in the proposal evaluation?
  - What negotiation and selection procedure should be use?
  - How much time will be needed to execute the procedure effectively?

b. Solicitation Planning

Once all the decisions are made in procurement planning a solicitation plan is developed which documents the product or service requirements and identifies potential suppliers needed to support the solicitation. Then, a solicitation is sent out which obtains quotations, bids, offers or proposals as appropriate. From these responses a vendor or supplier is chosen.

There are various types of solicitations:

- Invitation for bid (IFB) - This is used for purchasing routine items when buyer wants the best price.
- Request for proposal (RFP) – Used for more complex non-standard items where the description is not as clear as an IFB and monetary value is relatively high.
- Request for quotation (RFQ) - An RFQ is much smaller than an RFP and usually contains a request for a price, delivery date for standard products and any special packaging, shipping and handling conditions.
- Request for information (RFI) – Is also known as “contractor initial response” generally used when the buyer is not sure if the product or service is available or is the proper solution for the project requirements
- Invitation for negotiation – Is used when there is only one supplier capable or being considered. There are five stages of negotiation:
  - Protocol: setting the atmosphere, making introductions
  - Probing: Identifying issues of concern, judging strengths and weaknesses, finding areas of interest
  - Scratch bargaining: Actual negotiations occur and concessions made, points of concession identified and the gap narrows!
  - Closure: Positions summed up and final concessions reached
  - Agreement: documents drawn outlining final agreement, ensuring identical understanding by both parties

Selection criteria – There are generally three categories of selection criteria:

- *Management criteria* – With which vendor would there be the better relationship and trust. Does this vendor have a good performance reputation in their industry? Do they have a track record of successful technical capabilities?, Are they financially stable? Can they handle the capacity? Is their location acceptable? Do they have labor problems or managerial concerns?
- *Technical criteria* – Here criteria needs to be developed to evaluate:
  - *What* each vendor is offering
  - *How* each source will deliver the product/service
- *Price criteria* – Is the price proposed reasonable and how does it compare with the other responses.

c. Contract Administration

Many companies have standard formats to use for contracts. The project manager's role is to assist in drawing-up the contract to ensure that there is some type of control included in its contents – incentive and penalty clauses when appropriate.

## Contract Types

It is important to choose the best type of contract for the project. There are three broad categories:

- Unit price contracts
- Fixed price or lump sum contracts
- Cost reimbursable contracts
  - *Unit price contracts* – The vendor is paid a preset amount (e.g. \$80 per hour for services or \$3.12 per square yard for materials). The total reflects the quantities needed to complete the project. This is also commonly known as “time and materials”.
  - *Fixed price or lump sum contracts* – There is a fixed total price for a well define product. The risk is on the seller. There may be incentives or penalties for early or late delivery. There are different types of fixed price contracts:
    - *Firm-fixed price (FFP)* – Vendor commits to amount and assumes the risks, most appropriate for routine implementation projects with high seller confidence
      - Economic price adjustment clauses – usually based on factors beyond the seller's control thus lessening the risk for seller.

- *Re-pricing agreement* – Appropriate for short-term confidence in pricing, shifts some risk back to the buyer
- *Retroactive re-pricing* – This type should be avoided for it is determined after project completion
- *Incentive agreement* – Allows seller participation in cost savings sharing the risks
- *Escalation provision* – Adjustment up or down based on defined criteria
- *Cost reimbursable contracts* – This is primarily used for development projects with the risk on the buyer. It is appropriate for high uncertainty and/or risk. It requires
  - Clear and complete definitions
  - An appropriate formula for computing cost and profit
  - Close monitoring and approval of seller's costs
- **Cost reimbursement variations:**
  - **Cost-plus-fixed-fee (CPFF)**
    - Limits seller profit to fixed amount
    - Risk on buyer
    - Appropriate for unclear work requirements
  - **Cost-plus-incentive-fee (CPIF)**
    - Encourages cost effective performance
    - Contains rewards for savings and punishments for poor performance
    - Often used for lengthy project performance period
  - **Cost-plus-award-fee (CPAF)**
    - Buyer flexibility in dealing with seller
    - Award pool available for performance
    - Objective and subjective criteria used for evaluation
  - **Cost-plus-percentage-of-cost**
    - Prohibited with federal government
    - Risk on buyer
    - Incentives for seller to make cost as high as possible to maximize profit

It is important for the project manager and team members to be aware of what type of contract is used for each vendor. This will help control the vendor performance.

## **Contract Administration Policies**

- Compliance with contract terms and conditions
- Effective internal and external communication and control
- Effective control of contract changes
- Effective resolution of claims and disputes

## **Contract Administration Management Measures**

- Clearly define project requirements
- Determine measures of success
  - Decide on key indicators
  - Develop measure of success, both subjective and objective
  - Create methodology for capturing data
  - Identify reporting requirements for project team, sponsor and executives
- Communicate standards
- Implement contractor measures
  - Weight specific measures of key indicators
  - Measure each contractor regularly
  - Average input scores
  - Provide contractor feedback of individual score vs. average and best
  - Work with individual contractors to improve results
- Reward/terminate when appropriate

## **Contract Change Control Principles**

There are seven steps for contract change control principles

- Identify any actions that conflict with the terms of the contract
- Notify the other party in writing of the action
- Seek authorization for any change to the contract only by authorized people
- Estimate the cost of the changes and the effect to the schedule and procure sign-offs of approval from both parties before proceeding
- Team members document and report in writing all actions to comply with authorized changes and the cost and time to comply
- Project manager must seek compensation for increases in costs.
- Document all changes and have both parties sign-off

### Document Decisions and Events

- Contract modifications and working copies
- Internal and external correspondence
- Meeting minutes
- Progress reports
- Project diaries
- Telephone logs
- Photographs and videotapes

### Contractor Alliances

- Establish a senior-level Alliance Implementation Team (AIT)
- Hold kickoff and regularly scheduled meetings to identify concerns and develop common goals
- Develop measures of success and establish baseline results
- Develop sub-teams
  - Ownership of issues
  - Local improvement teams (LIT)
- Report progress

### Administrative Management Execution and Control – Project Manager's role:

- Plan for administration
- Manage change
- Monitor progress
- Manage triple constraints
- Maintain relationships
- Settle disputes
- Make payments
- Document when needed

#### d. Contract Close Out

Normally all the provisions for contract close out are specified in contract. The following items should be included as a minimum:

- Involves product/service verification of completion
- Written notice that contract is completed
- Administrative closeout

## 11. Obtain Communication Management Plan Approval

The project manager will meet with the project owner and review the communication management plan to obtain owner approval.

## 12. Finalize Project Charter

During the Planning Phase of the project, the project manager will finalize the project charter. An initial project charter was developed in the initiating phase during the project team detailed planning meeting and work session. After the owner has reviewed and agreed to the initial proposal and any scope changes are approved, the project charter is finalized and the owner's signature is obtained.

## 13. Conduct Management Review with Owner

The project manager will meet with the project owner to review the completed project charter and project plans developed during the Planning Phase. The project manager will follow the meeting guidelines described earlier when performing the management review. The project owner must give the approval to proceed to the Executing & Control Phase.

## 14. Develop Baselines

Once the project manager has obtained approval and the go ahead from the project owner, the project manager will develop the baselines. A baseline is the basis for determining how the project is progressing according to plan. The baseline is the original schedule, budget, and project plans plus any owner approved changes. Baselining allows all project stakeholders the opportunity to compare the actual project data against the baseline to determine if the project is on track.

## **2.3. Project Execution and Control Phase**

### **2.3.1. Purpose**

It is said that Project Management is 20% planning and 80% tracking and control. The project manager is like a lifeguard looking for someone to save. The project manager must monitor the project team at all times, because even the best team member can drown. Executing, monitoring and controlling project progress is important to detecting issues, problems and solutions early enough to quickly get the project back on schedule so the objectives are still met. While it is impossible to foresee and plan for every issue, project managers can regulate work as the project progresses, and still deliver a finished product that meets the objectives and requirements laid out in the initiation and planning phases.

The emphasis of the Execution and Control Phase is to ensure that each deliverable achieves the desired results, in the designated period, within the designated cost, and using the specified allocated resources. To ensure the accomplishment of that goal, continuous supervision of the project is required. The project manager must ensure that

all the plans leading up to this phase are in place, current and can be implemented as soon as the situation warrants.

### **2.3.2. Project Manager Role**

The project manager is responsible for controlling the project. He or she implements tracking and reporting processes, tracks the plan as it progresses and reschedules when needed to keep the project on track. During this phase the project manager is responsible for scope management. They will implement the change control process and manage the change control log. It is during this phase that customer deliverables are produced and the project manager is responsible for quality assurance and deliverable signoff. In addition the project manager is also responsible for executing the risk management plan and ensuring that risks have little or no unexpected impact on the project.

### **2.3.3. Inputs**

- Project Team
- Project WBS
- Communication Plan
- Risk Management Plan
- Organization Chart
- Responsibility Matrix
- Project Notebook
- Issues/Action Item Log
- Status Reports
- Project Schedule

### **2.3.4. Outputs**

- Current and Updated Project Schedule
- [Change Management](#)
- [Quality Management](#)
- [Phase Sign Off](#)

### 2.3.5. Step-By-Step Process

#### 1. Tracking

Immediately after management approval, a project baseline should be established. This baseline is the standard by which progress will be measured. Variances to the baseline may trigger implementation of contingency plans developed during the planning phase to keep the project on track. Once the project has begun, the project manager must have a way to effectively monitor the progress against the baseline. Many activities may be occurring simultaneously and may be difficult to control. In order to stay involved with all phases of the project, the project manager will establish a routine project review strategy and communication plan to ensure current, accurate and consistent progress feedback. The frequency of each project tracking/review is normally a function of the project's remaining duration. As the project draws to a close, the frequency should increase. Other variables such as project phase, complexity, management visibility, overall cost, current performance, and proximity to major milestones are also considerations.

#### 2. Status Meeting

Project status meetings should be held by the project manager, as needed, to review schedule and budget variances, focus on short term milestones, address any issues and assign action items, and gain support for required scope or strategy changes. The frequency of the status meetings is dependent on the expectations of the project owner and the progress of the project. Each meeting should be documented and meeting minutes distributed within 48 hours of the meeting.

#### 3. Change Management

Issues arise throughout the project that could cause change in scope to occur. Once a change has been requested, the project manager or the change originator will complete the [Scope Change Request Form](#) (Appendix B). The project manager will keep the [Scope Change Request Log](#) (Appendix B) in the project notebook.

##### a. Evaluate Scope Change Requests

An assessment of the impact of the scope change will be performed to examine the tasks, schedule, cost, and quality that may be affected by the change. A solution will be recommended based on the impacts assessed.

Project managers should use the following process steps to control changes in scope:

- Change in scope due to requirement change requests - Requests for changes will be formally documented and approval is required prior to re-baselining of the project plan.
- Change in scope due to design implications - The project manager will re-estimate the project following major milestones. If the new estimates exceed the baselined estimate significantly (i.e., requiring additional resources or

causing schedule slippage), the required change in scope is documented and approval is required prior to re-baselining the project plan.

For scope changes that impact major milestones, project team and project owner concurrence is required. After approval of the expanded scope the project plan is re-baselined by the project manager to reflect the new scope and submitted to the Program Office to be filed as the official documentation.

b. Assess Scope Change Impact

The project manager must ensure that the scope control process established during the initial scope definition is enforced. The project manager and core team members should scrutinize each Scope Change Request Form for its benefit and schedule/cost impact and the results should be communicated to the project sponsor for final approval. Each member of the core team should make a careful review of the impact of changes in scope before the change is approved.

c. Taking Corrective Action

Revisit the Planning Process - The success of a project is often determined by the strategy and recovery techniques the project manager uses when problems arise or changes in scope are made. The methods used to put a problem project back on a successful course are the same as those used to develop the original project execution plan. The ultimate goal is continuous schedule, resource and budget optimization.

Minimize Float Usage - During the entire execution phase, the team should adopt a proactive philosophy and think ASAP by establishing goals to out-perform the target project. A healthy amount of pressure should be maintained by the project manager to keep float usage at a minimum.

Crash the Schedule - If the schedule does slip, the first place to look for improvement is the critical path activities. Every activity in the critical path represents an opportunity to recover lost time. If a scope change is causing the end date of the project to be extended, the project manager should evaluate all tasks along the critical path to see if adding resources or re-evaluating the duration estimate could shorten durations.

Expand Work Breakdown - Breaking large activities down into smaller pieces is a good way to enhance control. "Divide and Conquer" is an appropriate strategy, especially when more information is available than when initial planning was performed.

Trend Analysis - If Earned Value Analysis is used and the resulting reports indicate a negative trend, the problem could be several individuals, or a combination of factors. Out of Target Projects, numerous scope changes, inaccurate planning estimates and progress reporting, are the most common occurrences the project manager should investigate and resolve.

d. Review Status with Owner

Once the scope change impact has been assessed, the project manager will schedule a meeting to review with the project owner. The project manager must have available the completed [Scope Change Request Form](#) and a recommendation for the project owner. Based on the impacts associated with the change and input from the project manager, the project owner will decide whether to approve or reject the request.

After the project manager and project owner have discussed the scope change request and associated impact, the project owner must sign the Scope Change Request Form and designate either the approval or rejection. For major scope changes, upper management approval is required. **The project manager will keep the owner signed Scope Change Request Form in the project files for future reference.**

e. Update Project Plans and Schedule

Typically scope changes require changes to the project plans and the project schedule. In order for any project plan or schedule to change, the project owner must have acknowledged his approval of such changes by signing the [Scope Change Request Form](#).

Usually not all project plans will require changes. The project manager must determine which project plans will be affected and update them accordingly. For example, the communication plan may require additional reports to be generated or the human resource plan may be altered to increase resources on the project. It is the project manager's responsibility to ensure that all project plans are updated and adhered to.

When schedule changes are made, the project manager must ensure all project stakeholders, especially project team members, are aware of the revisions.

4. Maintaining Quality

Quality Plans should not be seen as separate documents, but rather as a set of quality review activities that must be included in the project's detailed project plan. The project team members and subject matter expert's (SME's) will provide the project manager with reports noting compliance or noncompliance to the quality plan or quality expectations, specifications, and procedures. As needed, the project manager will intervene when quality is not acceptable. The determination of acceptability is within the owner and other stakeholders. The project manager is responsible for obtaining feedback from the owners and/or other stakeholders to determine if the requirements have been met. The primary method of obtaining quality feedback is to conduct regular quality reviews.

a. Quick Guide to Conducting Project Deliverable Quality Reviews

**What they are** - The primary reason for a review is to detect defects as quickly and economically as possible. It is well documented that it is much faster to correct oversights earlier in development than later.

**What they are not** - A performance appraisal. A place to bring your ego.

**When to have** - Reviews should be conducted as soon as a significant deliverable requires a progress or completion review.

**Who should attend** - Key stakeholders who are involved in the life cycle of the product, e.g., requirement gatherers to operations people.

**Who should not attend** - Supervisors. This is not a meeting where politics should be a factor, nor is it to be construed of as a performance appraisal. Participants for each quality review should be free from personal criticism or career implications. If personal performance is an issue, it should be address privately between the individuals involved – not in the quality review session.

b. Quality Assurance Roles and Responsibilities

A quality review will usually take the form of a meeting involving the following roles:

**The Presenter**, who is usually the author of the end deliverable.

**The Chairperson or Moderator**, who may be the project manager or any other competent person. This is a most demanding role, as it requires the ability to act as a chairperson as well as having an understanding of the end deliverable.

**The Reviewers**, who must be competent to assess the end deliverable. They must be thorough in their review and understand that they are taking personal responsibility for the quality of the end deliverable.

c. Maintaining Project Process Quality

Just as important to managing deliverable quality is the process of managing project process quality. Project managers should use the series of *Quality Checklists* (Appendix B) to monitor quality throughout the project life cycle. The following checklists are provided and should be tailored to the specific needs of the project:

5. Project Documentation

Throughout the project, the project manager will generate reports relating to quality issues and conformance. This will include the project status report and weekly status reports. A quality audit will be performed periodically to ensure accuracy of the information.

Throughout the project, the project manager will develop lessons learned to be placed in the repository. The lessons learned will address any issues or problems encountered in the quality of the project and the associated resolutions. Use the [Team Member Evaluation Form](#) (Appendix B) to gather and analyze lessons learned.

a. Produce and Distribute Documentation

The project manager must produce and distribute all the project documentation necessary to reflect any changes to the project plans and/or schedule. The Communication Matrix developed in the Planning Phase will detail the recipients, communication methods, and number of copies required.

b. 5.2. Produce Project Reports

During the project, the project manager is required to produce project reports. These reports are provided in Microsoft Project and include:

- Project Status Reports
- Deliverable, Task or Milestone Reports

6. Executive Review Meeting Facilitation

The executive review meeting/presentation may need to be conducted every month depending on the visibility of the project. It is one of the most informative ways senior management of the company can review the overall progress and status of the programs/projects being worked on in the company. Because this meeting will be for higher executives in the company, additional items will need to be considered. Some of these include:

- **Appropriate facilities** - Reserve the best meeting facility possible within the company. Reserve them well in advance. Make sure the climate settings are comfortable. If presentation equipment and props are to be used, make sure they are usable in the room. The meeting room should have speaker phone equipment in it. There should be extra seats available.
- **Invitation to meeting** - Because executive managers have more demand on their time, send out invitations to the meeting well in advance. A meeting agenda should also go with the invitation. Try to schedule meeting in the mid morning when the attention span is usually the best.
- **Materials** - Because executive managers have little time to spare, have all materials and extras ready well before the meeting. Spare meeting equipment (overhead bulbs, markers, easels etc.) is also desirable. Spare packets of the presentation material should also be made. Be Prepared!

These are the steps needed to conduct a typical executive review meeting.

- Send out invitations with meeting agenda well in advance (3 to 4 weeks) to the executives.

- Reserve meeting facility keeping in mind the previous criteria.
- Have project managers update all project report summary information. Have information consolidated. Review information for correctness.
- Prepare rough draft of meeting material. Practice presentation of material. Presentation will want to be in the 30 to 40 minute range. Make sure material relays exactly what information will need to be presented.
- Finalize material and produce presentation material packets along with any other needed materials (overheads, charts, and graphs).
- Confirm attendance from returned invitations. Know exactly who will be at the meeting beforehand.
- Day of meeting: Go to meeting room early to set up.
- Greet executives before meeting while passing out presentation material.
- Start meeting on time. Thank executives for attending.
- Have a designated person take meeting minutes.
- Present meeting material. If lengthy discussions start, use discretion to bring them to a stop to continue meeting.
- After material has been presented, open the floor up to questions.
- After meeting is concluded, thank attendees and state that meeting minutes will be forwarded to them within 48 hours.

## 7. Monitor and Control Project Risk

Risk control is the process of continually sensing the condition of a program and developing options and fallback positions to permit alternative lower-risk solutions. Continuously updating the risk management plan is an important step in risk avoidance and risk control.

At a minimum, risk plans, and additional risks should be reviewed weekly by the project manager and monthly by the entire project team. Plans must be updated and new plans developed as risks change throughout the life cycle of the project.

This component of risk management forms part of the day-to-day management of the project. It contains the following steps:

- **Implement risk avoidance actions** in accordance with the risk management plan.
- **Implement risk contingency actions** in accordance with the risk management plan, if risk avoidance does not occur.
- **Report on each risk issue** during progress reporting (internal to the project and at management (e.g., Steering Committee level). Develop corrective actions to project costs, schedule, quality, technical and/or performance as needed.

- **Monitor and analyze the effectiveness** of each risk control action. Modify or replace any actions that are ineffective.
- **Periodically update the list of managed risks** by “dropping” risk issues that have been avoided or no longer pose a real threat to the project. Add new risk issues as they surface during the project. Periodically, review the risk probability and impact information to ensure that this information remains current and accurate. Reassess the priority list to ensure the appropriate risks are being managed. This list will change as the project progresses and what was a low priority risk may become one of the top priority risks. If needed, develop a Risk Management Plan for any new risks in the top priority list.

Update Risk Management Plan. It is important that the risk management strategy is established early in a project and that risk is continually addressed throughout the project life cycle. Updating the risk management plan is essential to managing risk effectively.

## 8. Manage & Resolve HR Conflicts

During any project, issues/conflicts may arise. Due to the temporary nature of the project itself, team members may experience conflicts within their functional organizations for their time, personality conflicts among the team, and conflict associated with the incredible industry growth. This is a natural occurrence resulting from the differences in the organizational behavior of individuals, the differences in the way that functional and project managers view the work required, and the lack of time necessary for project managers and functional personnel to establish ideal working relationships.

Regardless of how well planning is developed, project managers must be willing to operate in an environment that is characterized by constant and rapid change. This dynamic environment can be the result of changes in the scope of work, a shifting of key project and functional personnel due to new priorities, and other unforeseen developments. The success or failure of a project manager is quite often measured by the ability to deal with change.

In contrast to the functional manager who works in a more standardized and predictable environment, the project manager must live with constant change. In his effort to integrate various disciplines across functional lines, he must learn to cope with the pressures of the changing work environment. He has to foster a climate that promotes the ability of his personnel to adapt to this continuously changing work environment. Demanding compliance to rigid rules, principles, and techniques is often counter-productive. In such situations, an environment conducive to effective project management is missing and the project leader too often suffers the same fate as heart-transplant patients, rejection.

There is no single method that will suffice for managing all conflicts in temporary management situations because:

- There exist several types of conflicts.

- Each conflict can assume a different relative intensity over the life cycle of the project.

If project managers are aware of some of the major causes of disagreements in the various project life-cycle phases, there is a greater likelihood that the detrimental aspects of these potential conflict situations can be avoided or minimized. The average conflict intensity perceived by project managers has been measured for various conflict sources and for various phases of the project life cycle. Seven potential sources have been identified and ranked as the most common cause of conflicts in the life-cycle of projects:

- Conflict over project priorities.
- Conflict over administrative procedures.
- Conflict over technical opinions and performance trade-offs.
- Conflict over manpower resources.
- Conflict over cost.
- Conflict over schedules.
- Personality conflict.

The project manager should proactively work with the project team in an attempt to avoid conflict. Many conflicts can be either reduced or eliminated by constant communication of the project objectives to the team members. Many times this continual repetition will prevent individuals from going too far into the “wrong” and thus avoid the creation of a conflict situation. Escalating the conflict to upper management should be the last resort for the project manager.

## 9. Adjust Schedules

There are several ways to update the schedule. Some of the most frequently used methods are: percent complete, remaining duration, duration completed a future estimated completion date, actual start, and actual finish. If the schedule is resource loaded, actual work periods completed or estimated work periods remaining should be reported. The goal is to provide enough information to accurately compare the present project status to the planned target. Actual dates are often reported carelessly, especially completion dates. This is true, because of the assumption by the person supplying the progress that it is only important that the work is reported finished. Accurate actual progress information is important for analyzing the current status of the project, but it is also important for historical project templating and benchmarking.

Project managers should update their scheduling tool and project plans at least weekly. Team members should be directed to report weekly at a minimum:

- Actual hours worked for each task for that week
- Whether the task was completed

- Remaining hours that they estimate it will take to complete each task
- Any issues that arise requiring corrective action

All reporting should be turned into the project manager by mid-day Friday so the project manager can update the schedule prior to a Monday Weekly Status Meeting or Report.

## 10. Troubled Project Process

A troubled project is any project that is behind schedule and/or over budget and/or is not meeting the requirements of the customer. Although there are ways to detect when a project is headed for trouble, too often symptoms are missed and/or ignored.

The troubled project process has two purposes. The first is to provide guidance in identifying symptoms that indicate that a project is headed for, or in trouble. The second is to outline the process to bring a troubled project back on track.

### a. Indicators of a Project in Trouble

The foundation for project success is laid during the Opportunity Assessment & Initiation Phase of the project management life cycle. It is during this phase that the business case or technical description is developed, outlining the opportunity, project objective, scope, and deliverables. It is here that a high-level risk assessment is performed. If this phase is cut short, the project is on its way to failure. Indicators include:

- Budget Indicators:
  - Concern that the project as a whole is over budget
  - Earned value indications that deliverables will not be produced on time and/or within budget
  - Unclear as to specific areas of development causing budgetary problems
  - Generalized vs. Targeted cutbacks
- Planning Indicators:
  - Poor planning, missing deliverables
  - Lack of a detailed project schedule
  - Not understanding the business problem
  - Not involving the stakeholders
  - Little or no risk assessment
  - Poor communications
  - Lack of processes, i.e. change control, issue management, scope management, etc.
  - Not enough or not the right resources

- Estimates-to-please vs. accurate estimates
  - Lack of deliverable owners
  - Schedule Indicators:
    - Arbitrary schedules
    - Inability to measure completeness
    - Vague objectives
    - Dependencies not defined
    - Inaccurate estimates
    - Mandated end dates
    - Tasks that are too large
  - Control Indicators:
    - Lack of processes (change control, issues management, etc.)
    - Team members cannot state project objective
    - Too many ad-hoc meetings
    - Lack of commitment from the staff
    - High turnover rate
    - Poor or no communications...lack of status reports
    - Communications breakdown with the owner
    - Personnel working on tasks that are different than tasks on the schedule
    - Project manager departs
    - Plan not baselined
    - Critically late tasks
    - Too much work remaining for the time frame of the deliverable
    - Schedule not up-to-date
    - “Nasty” e-mails sent back and forth
    - Project manager cannot give an accurate status of the project without conducting some research
    - Deliverables not signed off
    - Heavy overtime
- b. Causes of Project Failure

It is during the Opportunity Assessment & Initiation and Planning Phases of a project that the foundation of project success takes place. Planning is the foundation for all projects. Improper or lack of planning contributes more to project failure than any other cause.

- Causes of project failure that occur during the initial phases of a project include:
  - Lack of understanding of problem statement
  - Problem is a symptom
  - Objective is vague
  - Lack of proper scope
  - Missed deliverables
  - Lack of ownership for deliverable
  - No or poor risk assessment
  - Assumptions and constraints not fully understood
  - Accepting unachievable objectives
  - Over confidence
  - Lack of owner participation
- Causes of project failure that occur later in the project include:
  - Poor project tracking or no project tracking
  - Out-of-date documentation
  - Schedule not updated
  - Lack of team member enthusiasm
  - Little or no testing
  - Lack of re-planning each week to bring schedules back on track
  - Lack of physical inspection of deliverables
  - Lack of project sponsor involvement
  - Status reports that contain mostly noise not substance
  - Processes are dumped

c. Random Reviews

Symptoms of project failure can be detected through the use of random project reviews. These reviews are similar to those conducted at project completion. An individual or organization outside of the project should conduct them. The following steps provide an effective approach to an interim project review:

- Collect and review project documentation
- Interview team members
- Interview the owner
- Interview the project manager

- Facilitate a group discussion of the entire project team to identify successes, failures, and recommendations for improvement.

Properly developed and managed project status reports can “take the temperature” of the project and identify potential problem areas. These reports should come directly from the project management office and assuming the information at the project level is correct, they will provide an accurate picture of the project’s health.

d. Troubled Project Review Steps

This section outlines an effective approach in handling troubled projects. Of course, since all projects are different, the approach may be varied based on the circumstances for the project that is being addressed.

It is recommended that the individual assigned to correct a troubled project is independent, i.e. from another organization. This will help eliminate politics that may hinder corrections and improvements that might need to be made.

<b>Addressing a Troubled Project</b>	
Interview the project manager	Determine status of the project by reviewing the project schedule with them. Gain an understanding of the project organizational structure. Review the communication plan. Assess the level of project management skill the PM has.
Review project management processes and implement appropriate processes immediately	Determine if processes are in place for change control, communications, issues management, supplier management, scheduling, time tracking, meetings, and risk management. Implement processes as appropriate.
Collect and review documentation	This would include project charter, schedules, meeting reports, requirements, correspondence, etc.
Make information visible	Immediately start to put WBS’s, up-to-date schedules, and other pertinent project information on walls so that it is visible.
Conduct Gap Analysis	Review the project charter and the project schedule to determine if all deliverables are accounted for in the schedule. Begin to develop a charter if one is not available.

<b>Addressing a Troubled Project</b>	
Interview the owner	Verify the mission statement, scope statement, and objectives from the charter with the owner. Determine how effective communications have been. Review their requirements with them. Find out if they feel that their requirements are being addressed. Identify improvements that they may recommend.
Interview team members	Determine how much they know about the project's mission, objectives, deliverables, and strategic initiative supported. Review their work plans to determine if they reflect the actual work they are performing. Update project schedules to reflect accurate estimates to completion. Determine how much they understand of the project management processes that have been implemented.
Team session	Bring the team together to discuss how the project might be improved and to identify issues. Implement appropriate processes, such as change control, issue management, and the communication plan. Have the project manager restate the project mission, scope, and objectives.
Re-plan	Conduct a planning session that reviews the identified deliverables and looks for gaps. Before the meeting, construct a "straw man" WBS on one of the meeting room walls and use that as a starting point. Identify those deliverables that have been completed. Re-estimate the hours on the remaining deliverables. Break out the group into teams based on deliverable ownership. Have those teams break their work packages into tasks, assign resources, estimate durations, and determine dependencies.
Conduct Risk Assessment	Conduct risk assessment at the high and low levels.

<b>Addressing a Troubled Project</b>	
Consider “crashing” the schedule	Determine resources required finishing the remaining work. If the schedule is going to be missed, consider temporarily adding resources and/or overlapping dependencies to make the scheduled dates.
Consider reducing the scope of the project	Determine if any deliverable can be deferred to a later project. Meet with the owner and demonstrate the impacts on schedule, cost, and quality. Have several alternative plans available for review.
Streamline communications	Utilize exception reporting. Review meeting management and streamline meetings if possible.
Implement face-to-face meetings with owner (if appropriate)	Discourage e-mail in all situations when it is important that team members and the PM see the reaction of the owner or when e-mail has been used to send “hate” mail.
Reduce the number of ad-hoc meetings	Insure that ownership of deliverables is understood that deliverable owners have the correct tools, and up-dated schedules.
Consider a team building exercise	Conducted by an outside organization, off-site. Focus on identifying how team members depend on each other and in improving communications.
Develop plan to recover project	Create project schedule to pull the project back on track.
Risk management plan	Create a risk management plan that includes assessments throughout the remainder of the project.

## 11. Complete the Phase Sign-off

Project Sponsors may require that large projects be broken down into phases or very specific milestones. Where this exists, use the [Phase Sign-off](#) (Appendix B) to gain complete approval and acceptance before proceeding to the next phase or milestone.

## 12. Conduct Interim Project Review with Owner

Periodically arrange a meeting with the project owner to review the project schedule and other tracking documents and reports in detail is important to assure the project is progressing according to plan.

Managing the expectations of the project sponsor is the most important activity that a project manager can do. In most cases, bad news is better received in a timely manner versus a “surprise” late in the process. Be honest and up-front with the project sponsor. If the project sponsor wants to change the scope, demonstrate to them the impact of the change through the scope change process and gain their concurrence before proceeding. Saying yes is simple, but can have severe implications to the project if the impact is not known before the agreement was made. Many companies end up “eating” project costs because they agree to changes without understanding the project impact.

As the project nears completion, all the loose ends will start to surface and the project manager may be faced with presenting bad news concerning time, cost, or quality. If project sponsor expectations have managed well throughout the life cycle of the project, then closure for the project will be much easier.

## **2.4. Project Close-Out Phase**

### **2.4.1. Purpose**

During the Close-out Phase, all project activities are completed and all deliverables are finalized. The project sponsor reviews the project and all testing is completed. Final reviews and documentation are completed and the customer accepts the final project deliverable. The activities of this phase also ensure that best practices are captured and can be shared, and that continuous improvement on both team and personal levels is practiced.

### **2.4.2. Project Manager Role**

The project manager is responsible for archiving project documentation, obtaining deliverable sign-off, assessing customer satisfaction, capturing lessons learned, debriefing team members, and completing performance evaluations.

### **2.4.3. Inputs**

- Completed, up-to-date project schedules
- All project documentation
- Quality Checklists

- Phase Sign-offs, as appropriate

#### 2.4.4. Outputs

- Post Implementation Review
- [Performance Evaluations](#)
- [Lessons Learned](#)
- [Project Evaluation](#)
- [Delivery of Final Documentation](#)
- [Project Sign-Off](#)
- [Customer Satisfaction Survey](#)

#### 2.4.5. Step-By-Step Process

##### 1. Administrative Closure

The project manager is responsible for the administrative closure at the end of the project. This includes closing out all procurement contracts, matching up supplier invoices with payments, conducting performance reviews for the project team members and obtaining appropriate signatures to confirm completion of the project.

##### 2. Survey the Project Participants

Gaining feedback from the project participants is critical to ensuring and measuring the success or failure of the project. Project managers will use the following *Feedback Forms* found in Appendix B to gather participant feedback:

- [Performance Evaluations](#)
- [Customer Satisfaction Survey](#)

Use the information gathered to compile a summary of how well the project met the objectives and expectations defined in the project charter.

##### 3. Conduct Post Implementation Review

Post implementation meetings and/or case study documentation are important to capture the lessons learned to help steer future projects from pitfalls. Customer input as well as team member impressions can be valuable resource material in understanding and improving the project management process. These meetings also allow the project team to get together and discuss the project's successes and failures while bringing the project to closure.

A non-threatening post implementation meeting with agreed ground rules might be conducted as follows:

- An agenda outlining the items to be discussed is routed to attendees in advance.

- Allow one hour for the meeting.
- Attendees leave their titles outside the meeting room so everyone is equal and feel they can express themselves freely.
- The meeting facilitator uses a flip chart with black and red markers.
- What went well? – (Black marker on the flip chart)
- What did not go so well? – (Red marker on a separate flip chart)
- Post-it notes ranking each item 4-most important to 1-least important placed beside what each team members feels are the top 4 important items.
- The top 5-10 items are recorded.
- List possible solutions to avoid repetition of mistakes in the future.
- Develop a team report for management from the information and solutions input by the attendees.

#### 4. Develop Lessons Learned

Lessons can be learned from each and every project, even if the project is a failure. Some companies do not document lessons learned because employees are reluctant to sign their names to documents that indicate lessons learned were from mistakes or from a failed project. Consequently, many employees learn from their own mistakes but repeat the mistakes made by others due to lack of documentation.

The project manager is responsible for developing the lessons learned for the project with the assistance of the project team and owner. A complete summary from all closing activities should go into developing a comprehensive lessons learned summary.

#### 5. Send Documentation to Repository

Once the project manager has completed the administrative closure and developed the lessons learned from the project, all project information should be sent to the repository for future reference, if needed. Project information includes the project notebook (with all project plans, schedules, and meeting minutes) and the lessons learned. This information will be used on future projects to assist other project managers and team members by eliminating previously encountered problems.

#### 6. Hold Project Celebration

If the project has been successful, the project manager should hold a celebration for the project team. The entire team should have the opportunity to participate in the planning of the event. A team celebration provides an excellent opportunity to publicly and professionally acknowledge individual and/or team contributions and to present awards that may have been earned. The celebration will bring closure to the project for all project team members. Celebrations serve to foster a team-oriented culture that ultimately achieves success on future projects. Project managers should consider developing an award program by which outstanding performers can be recognized. Be creative with awards, but be sure they recognize individual

contributions to the project. Focus the awards on time or money saved, improved quality, leadership, technical know-how, or effective communication. All of these awards should be an encouragement to everyone and create a high level of enthusiasm for future projects.

### 3. Appendix A – Glossary of Project Management Terms

#### **A**

**Activity** - An element of work performed during the course of a project. An activity normally has an expected duration, an expected cost, and expected resource requirements. Activities are often subdivided into tasks.

**Activity Description (AD)** - A short phrase or label used in a project network diagram. The activity description normally describes the scope of work of the activity.

**Activity Duration** - The best estimate of the time (hours, days, weeks, and months) necessary to accomplish the work involved in an activity, considering the nature of the work and resources needed to complete it.

**Actual Cost of Work Performed (ACWP)** - The direct costs actually incurred and the indirect costs applied in accomplishing the work performed within a given time period.

**Actual Finish Date** - The calendar date work actually ended on an activity. The remaining duration of this activity is zero.

**Arrow Diagramming Method (ADM)** - A network diagramming technique in which activities are represented by arrows. The tail of the arrow represents the start and the head represents the finish of the activity (the length of the arrow does *not* represent the expected duration of the activity). Activities are connected at points called nodes (usually drawn as small circles) to illustrate the sequence in which the activities are expected to be performed.

**Actual Start Date** - The calendar date work actually began on an activity.

#### **B**

**Backward Pass** - The calculation of late finish dates and late start dates for the uncompleted portions of all network activities. Determined by working backward through the network logic from the project's end date.

**Bar Chart** - A graphic presentation of work tasks shown by a time-scaled barline (sometimes referred to as a Gantt chart).

**Baseline** - A management plans or scope document fixed at a specific point in time in the project life cycle and used to measure the progress of the project.

**Bottom-Up Estimating** - The process of developing an estimate in which the total estimate is the sum of estimates of all work packages.

**Budget** - (1) when unqualified, an estimate of funds planned to cover work occurring during a fiscal period. (2) A planned allocation of resources.

**Budget Cost** - The translation of the work estimate into hourly rates, quantity units of production, and so on. Budget costs can be compared to actual costs and variances developed to highlight performance and used to alert those responsible to implement corrective action if necessary.

**Budget Estimate (-10, +25%)** - A mixture of quantitative firm and unit prices for labor, material, and equipment used to establish required funds and to obtain approval for the project. Estimates are prepared from flowsheets, layouts, and equipment details.

**Budgeted Cost of Work Performed (BCWP)** - The sum of the budgets for completed portions of in-process work, plus the appropriate portion of the budgets for level of effort and apportioned effort for the relevant time period. BCWP is commonly referred to as earned value.

**Budgeted Cost of Work Scheduled (BCWS)** - The sum of the budgets for work scheduled to be accomplished (including in-process work), plus the appropriate portion of the budgets for level of effort and apportioned effort for the relevant time period.

## **C**

**Calendar** - A system to identify project workdays in developing a project plan. It can be altered so that weekends, holidays, and so on are not included.

**Calendar Unit** - The smallest unit of time used in scheduling the project. Calendar units are generally in hours, days, or weeks, but can also be in shifts or even in minutes. Used primarily in relation to *project management software*.

**Cash Flow Analysis** - The activity of establishing cash flow (dollars in and out of the project) by month and the accumulated total cash flow for the project by the measurement of actual versus budget costs. This is necessary to allow for funding of the project at the lowest carrying charges and is a method of measuring project progress.

**Change in Scope** - A change in objectives, work plan, or schedule that results in a material difference from the terms of an approval to proceed previously granted by higher authority. Under certain conditions (normally stated in the approval instrument), a change in resources application may constitute a change in scope.

**Change Request** - A formal written statement asking to make a modification to a deliverable.

**Chart of Accounts** - Any numbering system used to monitor project costs by category (i.e. labor, supplies, and materials). The project chart of accounts is usually based upon the corporate chart of accounts of the primary performing organization.

**Closeout Phase** - The fifth phase of the project management process, in which the project documentation is completed and archived in the project library and the project team is disbanded.

**Code of Accounts** - Any numbering system used to uniquely identifies each element of the *work breakdown structure*.

**Communications Management** - (1) The proper organization and control of information transmitted by whatever means to satisfy the needs of the project. It includes the processes of transmitting, filtering, receiving, and interpreting or understanding information, using skills appropriate to the application in the project environment. (2) The conduct or supervision of the exchange of information.

**Completed Activity** - An activity with an actual finish date and no remaining duration.

**Concept Phase** - The first five sequential phases in the project management process. During the Concept phase, the initial idea for the project is approved for preliminary planning efforts.

**Conflict Resolution** - The process of seeking a solution to a problem. Five methods in particular have proven effective:

- **Compromise:** To consent to agree; generally, each side wins or loses a few points.
- **Confrontation:** To work together toward a solution of the problem
- **Forcing:** To use power to direct the solution. This is a type of win-lose agreement in which one side gets what it wants and the other does not.
- **Smoothing:** To play down the differences between two groups and to give the points of agreement strong attention.
- **Withdrawal:** To remove oneself from the conflict.

**Contingency Allowance** - A specific provision for unpredictable elements of cost within the defined project scope; particularly important where previous experience in relating estimates and actual costs has shown that unpredictable events that will increase costs are likely to occur. If an allowance for cost escalation is included in the contingency allowance, it should be a separate item determined to fit expected escalation conditions for the project.

**Contingency Planning** - The development of a management plan that identifies alternative strategies to be used to ensure project success if specified risk events occur.

**Contract** - A binding agreement between a customer and a supplier in which the supplier agrees to provide goods and/or services in exchange for specific compensation from the customer.

**Contract Administration** - To monitor and control performance, review progress, make payments, recommend modifications, and approve suppliers actions to ensure compliance with contractual terms during contract execution.

**Contract Closeout** - The activities that ensure that the contractor has fulfilled all contractual obligations and has released all claims and liens in connection with work performed.

**Contract Documentation** - The documents included in the formal agreement between customer and supplier: the contract, letter of intent, agreements, task orders, memoranda of understanding, specifications, statement of work, and other relevant materials.

**Contract Guarantee** - A legally enforceable assurance of performance of a contract by a contractor.

**Control** - The process of comparing actual performance with planned performance, analyzing variances, evaluating possible alternatives, and taking appropriate *corrective action* as needed.

**Cost/Benefit Analysis** - A survey or computation of the quantifiable features of a project that will provide the customer additional information with which to make a knowledgeable decision.

**Cost Control** - The process of gathering, accumulating, analyzing, reporting, and managing the cost on an ongoing basis.

**Cost Estimating** - The process of assembling and predicting the cost of a project. Cost estimating encompasses the economic evaluation, project investment cost, and predicting or forecasting of future trends and cost.

**Cost Performance Index** - A measurement of the project's cost performance to date:

$$\text{CPI} = \text{BCWP}/\text{ACWP}$$

CPI <1 means the project is overrunning.

**Cost Variance** - The difference between the actual and budgeted cost for the work performed to date:

$$\text{CV} = \text{BCWP} - \text{ACWP}$$

CV <0 means the project is overrunning.

**Crashing** - An action to decrease the duration of an activity on the critical path by increasing the expenditure of resources.

**Critical Path** - The series of interdependent activities of a project, connected end to end, which determines the shortest total length of the project. The critical path of a project may change from time to time as activities are completed ahead of or behind schedule.

**Critical Path Method (CPM)** - A scheduling technique using the precedence diagramming method for graphic display of the work plan. CPM is the method used to determine the length of a project and to identify the activities that are critical to the completion of the project.

**Current Finish Date** - The current estimated calendar date when an activity will be completed.

**Current Start Date** - The current estimated calendar date when an activity will begin.

## **D**

**Definitive Estimate (-5, +10%)** - An estimate prepared from well-defined data, specifications, drawings, and so on. This category covers all estimate ranges from a minimum to maximum definitive type. These estimates are used for proposals, bid evaluations, contract changes, extra work, legal claims, permits, and government approvals. Other terms associated with a definitive estimate include check, lump sum, tender, post contract changes, and others.

**Deliverable** - Any measurable, tangible, verifiable outcome, result, or item that must be produced to complete a project or part of a project. Often used more narrowly in reference to an *external deliverable*, which is a deliverable that is subject to approval by the project sponsor or customer.

**Detailed Schedule** - A schedule used to communicate day-to-day activities to working levels on the project.

**Direct Project Cost** - The costs directly attributable to a project, including all personnel, goods, and services, together with all their associated costs, but not including indirect project costs.

## **E**

**Early Finish Date (EF)** - In the *critical path method*, the earliest possible point in time on which the uncompleted portions of an activity (or the project) can finish based on the network logic and any schedule constraints. Early finish dates can change as the project progresses and changes are made to the project plan.

**Early Start Date (ES)** - In the *critical path method*, the earliest possible point in time on which the uncompleted portions of an activity (or the project) can start, based on the network logic and any schedule constraints. Early start dates can change as the project progresses and changes are made to the project plan.

**Earned Value (EV)** - A method for measuring project performance. It compares the amount of work that was planned with what was actually accomplished to determine if cost and schedule performance is as planned.

**Estimate** - An evaluation of all the costs of the elements of a project or effort as defined by an agreed-upon scope.

**Estimate At Completion (EAC)** - The expected total cost of an activity, a group of activities, or of the project when the defined scope of work has been completed.

**Estimated To Complete (ETC)** - The remaining costs to be incurred to satisfy the complete scope of a project at a specific date. ECC is the difference between the cost to date and the forecast final cost.

## **F**

**Facilitator** - A person external to a group that helps the group work more effectively.

**Fast Tracking** - Compressing the project schedule by overlapping activities that would normally be done in sequence.

**Feasibility Studies** - The methods and techniques used to examine technical and cost data to determine the economic potential and the practicality of project applications. They involve the use of techniques, such as calculating the time value of money, so projects may be evaluated and compared on an equivalent basis. Interest rates, present worth factors, capitalization costs, operating costs, depreciation, and so on, are all considered.

**Float** - The amount of time that an activity may be delayed from its early start without delaying the project finish date.

**Forecast** - An estimate and prediction of future conditions and events based on information and knowledge available at the time of the forecast.

**Forward Pass** - The calculation of the early start and early finish dates for the uncompleted portions of all network activities.

**Free Float (FF)** - The amount of time an activity can be delayed without delaying the *early start* of any immediately following activities.

**Function Point Analysis (FPA)** - An approach to estimating software costs. It involves examining the project's initial high-level requirement statements, identifying specific functions, and estimating total costs based on the number of times each function is performed.

**Functional Organization** - An organizational structure in which people are grouped because they perform similar functions, such as engineering, administrative, or marketing.

## **G**

**Gantt Chart** - A timeline chart showing when certain processes take place and whether any of the processes will overlap.

## **H**

**Hammock** - An aggregate or summary activity. All related activities and tasks are tied as one summary activity and reported at the summary level.

**Hanger** - A break in a network path.

**Histogram** - A timeline chart illustrating utilization of a resource over time.

**Human Resources Management** - The function of directing and coordinating human resources throughout the life of the project by applying the art and science of behavioral and administrative knowledge to achieve predetermined project objectives of scope, cost, time, quality, and participant satisfaction.

## **I**

**Implementation Phase** - The fourth phase of the project management process in which the project is performed and delivered to the customer.

**Indirect Project Cost** - The cost that indirectly contributes to the project deliverables, but that are nonetheless required for the orderly completion of the project. They may include, but are not necessarily limited to, overhead and office costs, field administration, direct supervision, incidental tools and equipment, start-up costs, contractor's fees, insurance, and taxes.

**Inflation/Escalation** - The factors in cost evaluation and cost comparison that must be predicted as an allowance to account for the price changes that can occur with time and over which the project manager has no control (for example, cost-of-living index, interest rates, other cost indices).

**Integrated Cost/Schedule Reporting** - The development of reports that measure actual versus budget, BCWS, BCWP, and ACWP.

**ISO 9000** - A methodology by which an organization documents and then follows its quality-related processes and requirements. The set of standards helps organizations ensure that their quality systems meet certain minimal levels of performance.

## **L**

**Lag Relationship** - The four basic types of lag relationships between the start and/or finish of a work item and the start and/or finish of another work item: finish to start, start to finish, finish to finish, and start to start.

**Late Finish Date (LF)** - The latest time an activity may be completed without delaying the project finish date.

**Leg** - A modification of a *logical relationship* that directs a delay in the successor task. For example, in a finish-to-start dependency with a 10-day lag, the successor activity cannot start until 10 days after the predecessor has finished.

**Lessons Learned Reviews** - The audits carried out by the project team to learn from successes and mistakes in the project just completed and use that knowledge in future projects to repeat the successes and avoid the mistakes just experienced.

**Life Cycle** - The entire life of a system, product, or project, encompassing its conception, design, development, construction, operation, maintenance, repair, and decommissioning.

## **M**

**Management Reserve** - A fund withheld by the project manager to address unforeseen events or circumstances; separate from contingency allowances.

**Master Schedule** - An executive summary-level schedule that identifies the major components of a project and usually also identifies the major milestones.

**Matrix Organization** - Any organizational structure in which the project manager shares responsibility with the functional managers for assigning priorities and for directing the work of individuals assigned to the project.

**Milestone** - A significant event in the project, usually completion of a major deliverable.

**Mission** - A goal, end, or target that all or part of the enterprise is dedicated to achieving.

**Monitoring** - The capture, analysis, and reporting of project performance, usually as compared to plan.

## **N**

**Near-Critical Activity** - An *activity* that has low total *float*.

**Network Analysis** - The process of identifying early and late start and finish dates for the uncompleted portions of project activities.

**Network Logic** - The collection of activity dependencies that make up a *project network diagram*.

**Network Path** - Any continuous series of connected activities in a *project network diagram*.

**Node** - One of the defining points of a network; a junction point joined to some or all of the other dependency lines.

**Nondisclosure Agreement** - A legally binding document in which an organization promises to use another's proprietary data only for specific purposes and not to reveal or disclose that data to any other organization or individual.

## **O**

**Objective** - A desired result or outcome; the end toward which effort is directed.

**Order of Magnitude Estimate (-25, +75%)** - An approximate estimate made without detailed data that is usually produced from cost capacity curves, scale up or down factors that are appropriately escalated, and approximate cost capacity ratios. This type of estimate is used during the formative stages of an expenditure program for initial evaluation of the project. Other terms commonly used to identify an order of magnitude estimate are preliminary, conceptual, factored, quickie, and feasibility.

**Organizational Breakdown Structure (OBS)** - A hierarchical chart showing the relationships of human and material resources.

## **P**

**Parametric Estimating** - An estimating methodology using statistical relationships between historical values and project variables, such as system physical or performance characteristics, contractor output measures, or manpower loading. Also referred to as top-down estimating.

**Percent Complete (PC)** - An estimate, expressed as a percent, of the amount of work which has been completed on an activity or group of activities.

**Phase** - The division of a project time frame (or project life cycle) into the largest logical collection of related activities.

**Precedence Diagramming Method (PDM)** - A network diagramming technique in which activities are represented by boxes (or nodes). Activities are linked by *precedence relationships* to show the sequence in which the activities are to be performed.

**Predecessor Activity** - Any activity that exists on a common path with the activity in question and occurs before the activity in question.

**Program Evaluation and Review Technique (PERT)** - An event-oriented *network analysis* technique used to estimate project duration when there is a high degree of uncertainty with the individual activity duration estimates. PERT applies the *critical path method* to a weighted average duration estimate. Also given as *Program Evaluation and Review Technique*.

**Project Charter** - The primary document used to state the project mission, goals and objectives consistent with approved business plans. It defines the business opportunity, contains the scope statement, and summarizes project impacts and estimates in relation to the business plan.

**Project Communications Management** - A subset of project management that includes the processes required to ensure proper collection and dissemination of project information. It consists of *communications planning, information distribution, performance reporting, and administrative closure.*

**Project Cost Management** - A subset of project management that includes the processes required ensuring that the project is completed within the approved budget. It consists of *resource planning, cost estimating, cost budgeting, and cost control.*

**Project Human Resource Management** - A subset of project management that includes the processes required making the most effective use of the people involved with the project. It consists of *organizational planning, staff acquisition, and team development.*

**Project Integration Management** - A subset of project management that includes the processes required ensuring that the various elements of the project are properly coordinated. It consists of *project plan development, project plan execution, and overall change control.*

**Project Library** - The physical location of all project-specific documentation, including the project plan, contract, status reports, and other significant documents.

**Project Life Cycle** - The five sequential phases in time through which any project passes: Concept, Planning, Initiation, Implementation, and Closeout. These phases comprise activities, tasks, and subtasks.

**Project Management Body of Knowledge (PMBOK)** - The codification of all topics, subject areas, and intellectual processes involved in applying sound management principles to the collective accomplishment of any undertaking definable as a project. PMBOK is published and maintained by the Project Management Institute.

**Project Management Professional (PMP)** - A certification of project management skill awarded by the Project Management Institute (PMI).

**Project Management Software** - A class of computer applications specifically designed to aid with planning and controlling project costs and schedules.

**Project Manager** - The individual appointed with responsibility for managing the project. Acts as the customer's single point of contact for services delivered within the scope of a project. Controls planning and execution of the project's scope of activities and resources toward meeting established cost, timetable, and quality goals.

**Project Plan** - A formal, approved document used to guide both project execution and project control. The primary uses of the project plan are to document planning assumptions and decisions, to facilitate communication among stakeholders, and to document approved scope, cost, and schedule baselines. A project plan may be summary or detailed.

**Project Procurement Management** - A subset of project management that includes the processes required acquiring goods and services from outside the performing organization. It consists of procurement planning, solicitation planning, solicitation, source selection, contract administration, and contract closeout.

**Project Quality Management** - A subset of project management that includes the processes required ensuring that the project will satisfy the needs for which it was undertaken. It consists of quality planning, quality assurance, and quality control.

**Project Risk Management** - A subset of project management that includes the processes concerned with identifying, analyzing, and responding to project risk. It consists of risk identification, risk quantification, risk response development, and risk response control.

**Project Scope Management** - A subset of project management that includes the processes required to ensure that the project includes all of the work required, and only the work required, to complete the project successfully. It consists of initiation, scope planning, scope definition, scope verification, and scope change control.

**Project Steering Committee** - A consolidated oversight group that reviews the progress of the project, provides assistance when required, and assesses overall success.

**Project Time Management** - A subset of project management that includes the processes required ensuring timely completion of the project. It consists of activity definition, activity sequencing, activity duration estimating, schedule development, and schedule control.

## **Q**

**Quality Assurance (QA)** - The process of evaluating overall project performance on a regular basis to provide confidence that the project will satisfy the relevant quality standards.

**Quality Control (QC)** - The process of monitoring specific project results to determine if they comply with relevant quality standards and identifying ways to eliminate causes of unsatisfactory performance.

## **R**

**Recovery Schedule** - A specific schedule showing special efforts to recover time lost compared with the master schedule.

**Remaining Duration (RDU)** - The time needed to complete an activity.

**Request for Information (RFI)** - A formal invitation containing a scope of work that seeks information regarding products or services from vendors without creating a basis for a contract.

**Request for Proposals (RFP)** - A formal invitation containing a scope of work that seeks a formal response (proposal) describing both methodology and compensation to form the basis of a contract.

**Request for Quotations (RFQ)** - A formal invitation containing a scope of work that seeks a cost or price quotation to perform the work or provide the product specified as the basis of a contract.

**Resource** - (1) A factor, except time, required or consumed to accomplish an activity. (2) Any substantive requirement of an activity that can be quantified and defined, such as manpower equipment or material.

**Resource Allocation Process** - The scheduling of activities in a network with the knowledge of certain resource constraints and requirements. This process adjusts activity level start and finish dates to conform to resource availability and use.

**Resource Leveling** - Any form of *network analysis* in which scheduling decisions (start and finish dates) are driven by resource management concerns (e.g., limited resource availability or difficult-to-manage changes in resource levels).

**Responsibility Assignment Matrix (RAM)** - A structure, which relates the project organization structure to the work breakdown structure to help ensure that each element of the project's scope of work, is assigned to a responsible individual.

**Retainage** - A portion of a contract payment that is held until contract completion in order to ensure full performance of the contract terms.

**Risk Assessment** - The identification and analysis of project risks ensuring that they are understood and prioritized.

**Risk Event** - A discrete occurrence that may affect the project for better or worse.

**Risk Mitigation** - The act of revising the project's technical approach, scope, budget, schedule, or quality, preferably without materially affecting the project's objectives, in order to reduce risk.

## **S**

**Schedule Performance Index** - A comparison of the project's time performance to its schedule:

$$SPI = BCWP/BCWS$$

SPI <1 indicates the project is behind schedule.

**Schedule Variance** - A difference between the projected duration for an activity and the actual duration of the activity:

$$SV = BCWP - BCWS$$

SV indicates the project is behind schedule.

**S-Curve** - Graphic display of cumulative costs, labor hours, or other quantities, plotted against time. The name derives from the S-like shape of the curve (flatter at the beginning and end, steeper in the middle) produced on a project that starts slowly, accelerates, and then tails off.

**Scope** - The work content and products of a project or component of a project. Scope is fully described by naming all activities performed, the resources consumed, and the resulting end products, including quality standards. A brief background of the project or component and its general objective(s) should introduce a scope statement.

**Scope of Work** - A narrative description of the work to be accomplished or resources to be supplied under a contract.

**Substantial Completion** - The point in time when the work is ready for use or is being used for the purpose intended and is so certified.

**Successor Activity** - In the *arrow diagramming method*, the activity which departs a node. In the *precedence diagramming method*, the “to” activity.

**Summary Level** - The elements of a project work breakdown structure at the major subsystem level.

## **T**

**Team Building** - The process of influencing a group of diverse individuals, each with individualized goals, needs, and perspectives, to work together effectively for the good of the project such that their team will accomplish more than the sum of their individual efforts could otherwise achieve.

**Total Quality Management (TQM)** - A common approach to implementing a quality improvement program within an organization.

**Trend Analysis** - A mathematical method for establishing tendencies based on past project history and allowing for adjustment, refinement, or revision to predict cost. Regression analysis techniques can be used for predicting cost/schedule trends using data from historical projects.

## U

**Update** - To revise the schedule to reflect the most current information on the project.

**User Requirements** - A statement that functionally describes the software, hardware, or other business need as well as the general business need it is intended to meet.

## V

**Variance Analysis** - An analysis of the difference between planned and actual performance:

- Cost Variance =  $BCWP - ACWP$
- % Over / Under =  $(ACWP - BCWP) / BCWP \times 100$
- Unit Variance Analysis
  - Labor Rate
  - Labor Hours/Units of Work Accomplished
  - Material Rate
  - Material Usage
  - Schedule / Performance -  $BCWP - BCWS$

## W

**Work Breakdown Structure (WBS)** - A deliverable-oriented grouping of project elements, which organizes and defines the total scope of the project. Each descending level represents an increasingly detailed definition of a project component. Project components may be products or services.

**Work Package** - A deliverable at the lowest level of the *work breakdown structure*. A work package may be divided into activities.

## 4. Appendix B - Basic Toolkit Forms and Templates

The following list of forms and templates comprise the Basic Toolkit and are required for every project. Each form is located in this appendix.

### 4.1. *Opportunity Assessment & Initiation Phase*

- [Opportunity Summary](#)
- [Pre-Sales Budget Worksheet](#)
- [Opportunity Assessment Detail](#)
- [Quality Assurance Template](#)
- [High Level Work Breakdown Structure](#)
- [Client Cost Benefit Analysis](#)
- [Problem Identification](#)
- [Proposal Checklist](#)
- [Project Proposal Document](#)
- [High Level Project Charter](#)

#### 4.1.1. Opportunity Assessment & Initiation Phase Tools

- [High Level WBS Process](#)
- [High Level Risk Identification Process](#)

### 4.2. *Project Planning Phase*

- [Communications Plan](#)
  - [Communications Matrix](#)
  - [Issue Log](#)
  - [Action Item Log](#)
  - [Documentation Matrix](#)
  - [Status Reports](#)
  - [Organization Chart](#)
  - [Project Team Directory](#)
- [Project Charter](#)
- [Resource Request Form](#)

- [Project WBS](#)
- [Requirements Traceability Matrix](#)
- [Responsibility Matrix](#)
- [Risk Assessment Template](#)
- [Risk Management Priorities](#)
- [Project Notebook](#)
- [Developing Task Worksheet](#)
- [Project Schedule](#)

#### **4.2.1. Project Planning Phase Tools**

- [Risk Assessment Process](#)
- [Risk Management Guide](#)

#### **4.3. Project Execution and Control Phase**

- Current and Updated Project Schedule
- [Change Management](#)
- [Quality Management](#)
- [Phase Sign Off](#)

#### **4.4. Project Close-out Phase**

- [Post Implementation Review Guide](#)
- [Performance Evaluations](#)
- [Lessons Learned](#)
- [Project Evaluation](#)
- [Delivery of Final Documentation](#)
- [Project Sign-Off](#)
- [Customer Satisfaction Survey](#)