



PROJECT MANAGEMENT ESSENTIALS

Applying the Elements of Success

Seminar Action Guide



V 5.2C

Project Management Essentials



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Section

1

Introduction to Project Management

Welcome! Whether you are an "old salt" with much to share, a "rookie" with much to absorb, or somewhere in between, we're glad you're with us! Together we'll make a rewarding learning experience for all.

This action guide has been custom tailored for your organization and the learning objectives identified. The project management methods, procedures, and vocabulary within is compliant with most popular standards and authoritative bodies but is by no means all-inclusive. For example, of the nine knowledge areas identified by the Project Management Institute's Standards Committee, seven areas are addressed in this course at the fundamentals level: Project Integration, Scope, Time, Cost, Human Resource, Communications, and Risk Management. The remaining two areas, Quality and Procurement, are functionally or departmentally prescribed and thus, are not covered in this course.



Section One Objectives

This icon indicates each section's key learning objectives. To make the most of your learning experience, be sure to review the objectives before proceeding. They'll help you focus on key concepts, connect details with the big picture, judge importance, and integrate your learning experience. The key at the right provides an overview of icons used within the action guide.

The primary objectives of Section One are to

- create an effective learning environment
- identify and prioritize your learning goals

ICON KEY

⊕ Objectives

📌 Key Concepts

📖 Definitions

✍ Exercise

👤 Team Tips

⚙ Tool Tips

📄 Research Facts

🗨 Useful Words

What to Expect in the Course

The purpose of this course is to help you succeed on every project undertaken. In our business, failure is not an option!

This course can't solve all the issues you face, but it can improve your odds of success, reduce unexpected problems, increase project flexibility, balance resources and project durations more effectively, improve communications, and help you satisfy key stakeholders more consistently.

There is much to be gained when project teams embrace the fundamentals of project management.

The way to achieve success is first to have a definite, clear, practical ideal: a goal, an objective.

Second, have the necessary means to achieve your ends: wisdom, money, materials, and methods.

Third, adjust your means to that end.

—Aristotle

This course will help you master the core competencies. In it, you will learn how to:

- Communicate clearly with a common project management language.
- Adopt an effective project management process.
- Use CPM and PERT techniques for scheduling, monitoring, and controlling.
- Set realistic goals, budgets, and timelines.
- Improve tracking and control without getting mired down in excessive detail.
- Communicate better with upper management, department heads, subordinates, vendors, and end users.
- Increase your ability to deal with project unknowns.
- Create effective Work Breakdown Structures, even for complex projects with diverse, cross-functional teams.
- Estimate task durations with greater accuracy.
- Create project control and tracking baselines.
- Identify project risks and create contingency plans. Apply normal, expedite, and fast-track scheduling strategies.

- Balance resources in multi-project environments.
- Discriminate between activity and true progress.
- Provide a framework for problem solving and trouble shooting.
- Know when and why to use project management software.

Project Management Survey

The survey on the following page can help you gauge the status of your organization's project proficiency and the effectiveness of your teamwork. You may add other considerations or concerns specific to your project environment at the end of the survey.

1. Circle the number that best fits your judgment of each item's proficiency level.
2. Calculate your total score and then compare with your nearby colleagues.
3. Which item(s) do you believe need(s) attention first?
4. Why?

Project Management Survey

Description of Survey Item	Scale				
	-	1	2	3	4
Our projects are always completed successfully, on time, and on budget.	1	2	3	4	5
Project work proceeds in a systematic and productive manner.	1	2	3	4	5
Individuals assigned to the project work as an effective, cohesive team.	1	2	3	4	5
The project's actual cost closely matches the estimate.	1	2	3	4	5
The project's actual duration closely matches the estimate.	1	2	3	4	5
All work is well defined before the project is implemented.	1	2	3	4	5
When unforeseen issues arise, they are minimal—creating few serious problems during implementation.	1	2	3	4	5
Upper management supports our project team and our needs.	1	2	3	4	5
All project team members have specific roles and responsibilities that they understand and are committed to.	1	2	3	4	5
Projects never stall out in late stages. Progress continues smoothly from the beginning of the project to the end.	1	2	3	4	5
When two or more projects require the same resource, allocation is logical, fair, and appropriate.	1	2	3	4	5
Inter-departmental communications are fruitful and effective.	1	2	3	4	5
Progress is measured and reported accurately throughout the project by all participants.	1	2	3	4	5
Individual stress levels are typically low to moderate, and rarely severe.	1	2	3	4	5
The organization uses an effective project management process.	1	2	3	4	5
Project team members are able to focus on project work without inordinate interruptions or excessively competing demands.	1	2	3	4	5
We always get the project results we want.	1	2	3	4	5
Other concerns:	1	2	3	4	5

The Golden Rules of Project Success

1. Never start a project without a clear _____.
2. Gain stakeholder consensus on all project _____.
3. Set clear expectations with a thorough _____ statement.
4. Identify project stakeholders, their _____ and their _____.
5. Monitor progress at the _____, _____, and _____ levels.
6. Recognize that when everything is a _____, nothing is a _____.
7. Create _____ schedules.
8. Keep everyone on the project _____.
9. _____ yourself and others on your team.
10. Every stakeholder has a _____, _____, whether you know what it is or not.
11. Every project has a _____, _____, whether you know what it is or not.
12. The most important date(s) of a project is (are) _____.



Key Concepts

Project success depends on many factors. These include technical competency, clear communications, organizational support, stakeholder commitment, control systems, and high levels of teamwork.

The project management body of knowledge provides practical solutions to many of the factors that enable project success. It is in effect, the compilation of the experience and techniques of thousands of project leaders throughout many industries and countless projects. It has proven useful for not only professional project managers, but also for those professionals who only occasionally manage projects.

Organizations can improve their project success rates when each and every individual project team member has basic competencies in, and commitment to, four essentials:

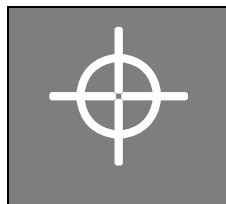
1. A common project management vocabulary.
2. A clear and effective project management process.
3. Mastery of the basic project management tools and techniques.
4. High levels of teamwork.

To get the most out of this course give yourself permission to be receptive, master the vocabulary, the process, and the tools. You'll then be able to effectively judge their merits and effectively adapt the approach, process, and tools most appropriate for your project's and your team's needs.

Here's to you success!

The Project Management Process

The project management process improves communication, cooperation, and control. Without an effective process, projects are more difficult than they need to be.



Section Two Objectives

The purpose of this section is to provide workshop participants with an understanding of the importance of a well designed, broadly adopted project management process. A case will be made for adoption of the described approach. The learner is encouraged to validate the model and its usefulness based on their own experience.

At the conclusion of this section, participants will be able to be participate more effectively in projects by being able to:

1. Identify the key processes within the project's lifecycle and describe how the processes are controlled.
2. Discuss the advantages and disadvantages of each model.
3. Describe typical stakeholder roles and responsibilities within the process.
4. Describe the pros and cons of project control documents.
5. List the common project control documents and describe their purposes.

People ask for the secret to success. There is no secret, but there is a process.

—Nido Quebin

The Project Lifecycle Model

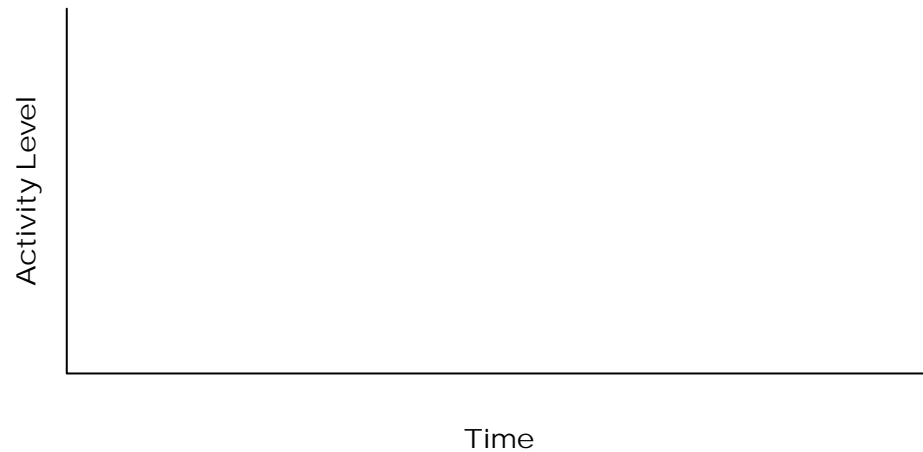
Initiate

Plan

Execute

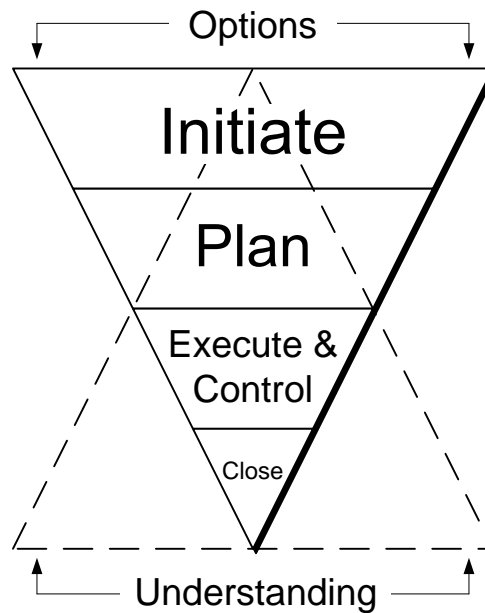
Control

Close



The process phases are not simply discreet, sequential steps. The progressive nature of project management and phase interdependencies produces an array of concurrent activities.

Your ability to impact success rapidly deteriorates as the project progresses.



Project Decision Points

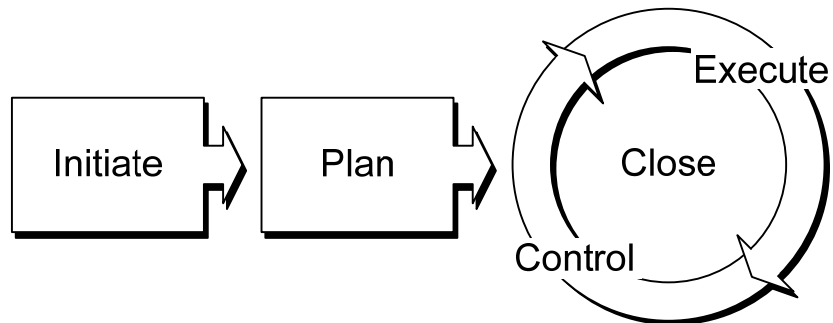
If you manage project decisions, you'll manage project success.

When the project process is viewed as an interactive system, it becomes clear that each stage of the process provides an opportunity to control the project. As our process models all indicate, output of one phase becomes input for the next phase.

Projects don't fail at the end; they fail at the beginning.

—Ron

Each phases' entry and exit point, and the information or results thereof, are important decision points. It is from these points that well informed, timely, and effective managerial action may best be taken.



The process model provides a systematic approach to managing decisions throughout the project's lifecycle.

Communication and Control

Process effectiveness, to a large degree, is governed by the quality and completeness of information flow. As projects become increasingly complex—involving more people, more expertise, more technology, etc.—success becomes increasingly dependent upon effective communications. But, be careful. *More* documentation does not always yield *better* communication. Indeed, the reverse could be true!

It is best to do things systematically, since we are only human and disorder is our worst enemy.

—Hesoid, 800 B.C.

Carefully balance the burden of formalized communications with the intended results. Documentation required for a large project may be overly burdensome for a small project. Small project documentation may be overly simplistic for complex projects, or for those projects where the team has limited experience.

Rigging Your Project for Success

One of the most important things you can do to improve the odds for success, is to select an appropriate project process and an effective means of controlling it. Consider:

- The project's overall complexity
- The organization's commitment to the project
- The experience, capabilities, and geographic distribution of the team
- Project risk, quality, and difficulty
- Constraining factors

The word is not the thing.

—S. I. Hyakawa

...the process is not the project.

—Ron

With the above in mind, select which communication and control documents are needed.

Keep it simple, keep it useful, and keep it easy. Communication and control documents take on many forms—informal to formal, simple to complex: checklists, templates, meeting agendas, CPM schedules, variance charts, and more. However, "more" isn't always better.

Any effort or activity that does not provide genuine benefit is a double detraction: wasted time and energy could have achieved real progress.

The project process (and the burden of its supportive documentation) must be beneficial to the project team as well as management, if it is to survive. The decisive test is simple: does the process help or hinder the team as a whole?

Principles that are established should be viewed as flexible, capable of adaptation to every need. It is the manager's job to know how to make use of them, which is a difficult art requiring intelligence, experience, decisiveness, and, most important, a sense of proportion.

—Henri Fayol, 1916

Make sure that every document, control gate, and check list benefits the project in at least one of the following areas:

1. Collecting and distributing essential information.
2. Preventing errors of *omission* and errors of *commission*.
3. Facilitating timely and informed decision-making.
4. Reducing the occurrences of faulty assumptions, overoptimism, and overcommitment.

Managing the Process of Success

Appropriate use of the project management process can greatly improve customer satisfaction, profitability, and daily workflow. This section is intended to provide a basic set of control documentation. While each of these documents can be used as provided, they are best used as a guideline for creating your own set of essential decision and information control points.

Typical Process Control Documents

Concept checklist The concept screening checklist helps to ensure that only viable projects that support the organization's goals and objectives are allowed to proceed. Screening criteria make include preliminary investigations, feasibility studies, evaluation of merit, strategic fit, viability, delivery of real benefit, risk level, project portfolio fit,

and whether or not it would detract from ongoing operations, other projects or capacities. Project prioritization begins at this point.

Project Charter This document establishes the authority for a project manager to undertake the project and sets the limits of responsibilities and power. It serves as a formal notification and alerts stakeholders that project initiation will proceed.

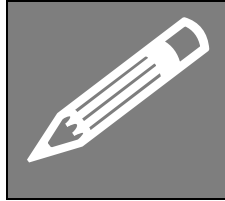
Statement of Work (SOW) This document helps the originators and sponsors to clearly describe and document their expectations of the project. It includes goals, measures of success, constraints, deliverables, and the project's intended outcomes. It eases the hand off from upper management's vision to the planning and execution team's realities. It will likely be challenged, negotiated, and modified as various stakeholder groups interact with it. Prior to moving forward, consensus on the S.O.W. content with all significant stakeholders should be reached.

Project Initiation Document (PID) This document is a one page aggregation of all initiation phase decisions for smaller projects. Ease of use and brevity is weighted heavily in its design. It can readily serve as a preliminary document, when considering how much process structure and control is suited for a given project. This document and the listed abbreviation is not recognized in the PMI PMBOK®.

Scope Statement The scope statement takes on a project specific format. It's purpose is to describe in great detail everything that the project includes and conversely, everything that the project does not include. It helps manage stakeholder expectations and provides the planning team with a starting point for identifying the work activities, materials, resources, and others items necessary for achieving the project's outcomes.

Baseline Plan This term is used to describe what might need to be many documents. They could include the project's schedule, resource requirements, budget, finalized scope, communications plan, and others. In the context of the process model, the baseline plan is the agreed upon approach and formally signed off notice to proceed to the execution phase of work. The baseline plan is used in conjunction with measured progress actuals, to track progress, evaluate results, and judge the effects of corrective actions. Strategically, the baseline plan should be safe, simple model that supports all project constraints and objectives and is deemed highly likely to succeed by the planning and execution team.

Scope Change Request This control document identifies requested changes and helps manage alterations to the scope of the project. It describes the change, it's purpose, any important background information, the proposed approach, and the impact on progress, cost, time, and resources. The document can serve as a formal notice to proceed, revise, or kill the proposed change. Signature lines should be included to signify authorization and agreement. From the project manager's point of view, it provides the information and sets the stage so that they are able advocate properly for or against the requested change.



Exercise: Understanding Process Roles and Responsibilities

Team up with several colleagues and fill in the chart below. Be prepared to discuss your findings with the class.

	Leads or Facilitates	Participates	Provides Information	Final Authority
Initiate				
Plan				
Execute				
Control				
Close				

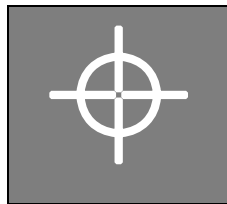


Key Concepts

1. Successful projects require high levels of coordination, communication, and control.
2. The most important project decisions are made early in the project lifecycle, when teams have the least information.
3. The project management process helps team members understand their individual roles and responsibilities.
4. The project management process provides a standard operating method that can be continually improved.
5. An effective project management process provides checks, balances, and "self-healing" validation at each phase of the project.

Project Initiation

Nothing is more important to finishing a project than a careful start.



Section Three Objectives

The initiation phase is considered by experienced project managers as the most influential phase of the project. During this phase the project's measures of success are established, stakeholder expectations are set, methods are chosen, resources are first committed (usually with little detail or accuracy), and (rightly or wrongly) deadlines are established. Minor successes or failures in this phase are rippled, and in some cases multiplied, many times over as the project unfolds.

Objectives of this section include:

1. Understanding how activity in this phase affects project success or failure.
2. Adopting an effective, systematic approach for initiating your projects.
3. Being able to identify project stakeholders and understand their significance in the ultimate success of the project.
4. Setting useful project goals.
5. Understanding the triple constraint philosophy and how to apply it in your projects.
6. Improving communication and control throughout the project by improving initiation phase effectiveness.

You create the finish line you will later cross. Make the line clear to all stakeholders.

—Ron

Start Slow to Finish Fast

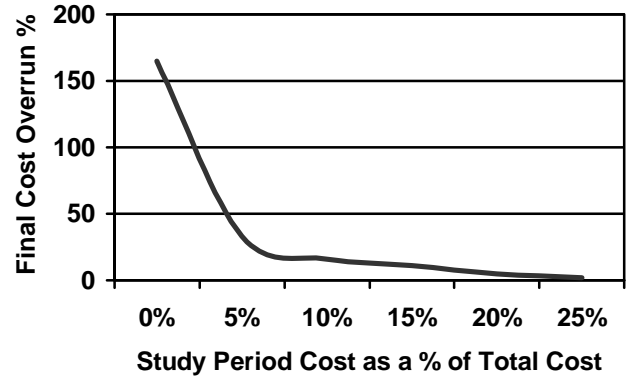
A modest time investment in the early stages of a project will reap significant rewards throughout the life cycle.



Industries and projects vary, but it is generally agreed that effort expended in the initiation phase pays for itself many times over.

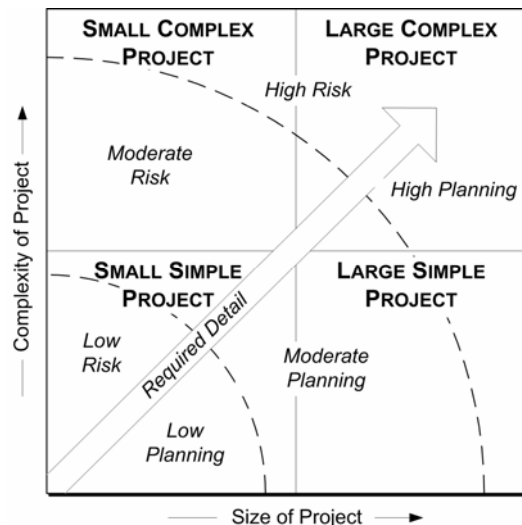
Consider the data collected on 25 NASA projects.

While the overruns shown here may be greater than for less complex projects, the effects of poor project initiation is observed in most project environments.



Commercial projects using known components, materials, technologies, and resources, mirror these results (as a percentage of planned versus actual profitability). In competitive markets, a cost overrun as little as 5% can turn victory into disaster. Similar mistakes on not-for-profit or internal projects can cripple organizational efforts.

There is also a risk of planning too much! “Analysis paralysis” can be a real problem when projects entail genuine risk, personal exposure, or political conflict. In general, balance the amount of time and energy you invest in planning based on the complexity, risk, communication, and technology challenges faced. But remember, sometimes you are better off moving ahead without a “perfect plan”—even if mistakes must be made to create progress.



The time and detail allotted to a give project should be scaled according project size, risk, and complexity.

Creating Effective Project Goals

Project managers are obsessed with achievement, and rightly so. A carefully written goal focuses attention on the intended results, allows measurement of success, and communicates expectations clearly and concisely.

The ability to create meaningful goals is useful throughout the project process:

- In the initiation phase, goals focus team efforts, guide communications, help us understand what needs to be accomplished, help set stakeholder expectations, and provide references for prioritization efforts.
- In the planning phase, goals help us identify required work, describe objectives, select milestones, and write effective activity (task) descriptions.
- In the implementation phase, goals help us direct the work of others, keep their efforts on task, and lead teams to cooperative achievement.
- In the completion phase, goals help us measure quality, completion, and overall success.

The SMART goal acronym is an excellent approach for creating useful goals:

Success Rule #1

Nothing is more important to project success than a clear goal.

S_____

M_____

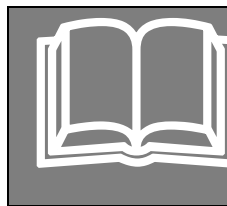
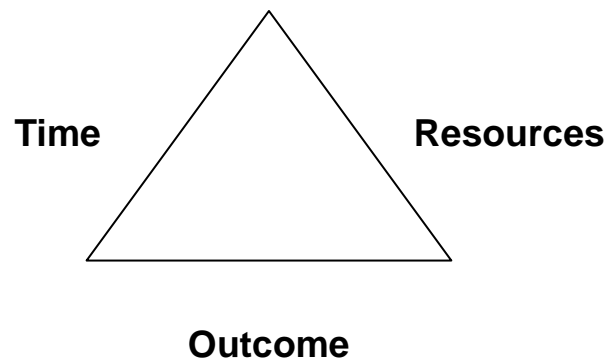
A_____

R_____

T_____

The Triple Constraints

Through intuition, training, or experience, successful project managers constantly balance the project's resources, time, and intended outcomes—the triple constraints. And, while there are many other important constraints (ranging from attitude to technology) which must be carefully managed, **time**, **resources**, and **outcomes** set the stage for most strategic and tactical project management decisions.



Definitions—Triple Constraint Priorities

The following terms help project teams describe and discuss the relative importance and flexibility of the triple constraints. Appropriate usage of these terms enables project teams to better understand project priorities, identify realistic options, and generally make better decisions.

Success Rule #2

Negotiate a GAP in the triple constraints.

Driver: The most important and therefore least flexible constraint. By definition, driving constraint(s) must be achieved or the project is a failure.

Middle: The constraint(s) that is (are) more flexible than the driver, and more important than the weak constraint(s).

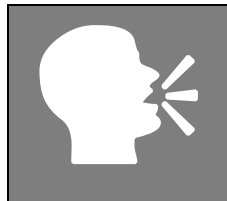
Weak: The constraint(s), though important, that is (are) less important and therefore more flexible than the driver(s).

Threats to Project Success

Outcome

Resources

Time



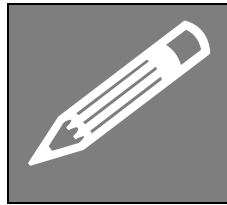
Useful Words—Identifying Constraint Priorities

Build a positive rapport with the project's owners, sponsors, and end-users. Then use the following techniques to reveal the triple constraints, their prioritization, and their flexibility.

- Why are we doing this project?
- Above all else, what *must* this project achieve?
- If we had plenty of time, money, and resources, what would the project look like?
- What is the best possible outcome you could expect from this project?
- If time and resources were limited, what would be the minimum acceptable results this project would achieve?
- Scenario... What if...? What's best...?

Using a Preplanning Checklist

It has been said that a short list is better than a long memory. Whether it is used as an informal checklist, or strict procedural control, a preplanning checklist will help you identify important or missing information. *The busier we get, the more we must rely on a systematic approach to prevent errors of omission.*



Exercise—Integrating the Concepts

Review the Project Initiation Checklist provided in the appendix of this Action Guide with your nearby colleagues.

Consider how it might be adapted or edited to serve your needs. If you currently use a similar document, discuss any merits or shortcomings you see.

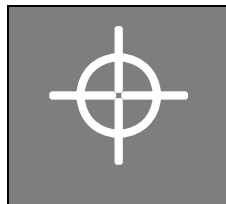


Key Concepts

1. Goals are the threshold skill to all success and the primary communication tool for those focused on results.
2. An understanding of the triple constraints is essential for making good project decisions.
3. Flexibility in the triple constraints helps you deal with problems that are known, unknown, and even unknown unknowns.

The Planning Phase

Planning is a learning process. Trust in it. While no plan is ever perfect, perfection is not the aim—knowledge is.



Section Four Objectives

The section's purpose is to provide the vocabulary, techniques, and methods that will help every participant be a more collaborative and effective project team member. In it we'll explore the tools, techniques, and strategies needed to create effective implementation plans. With that said, it is important to note that every tool is not always required on every project, nor do individual project team members have to "go it alone" and master every technique for themselves. This section advocates a team approach to project planning. Upon completion of this section, participants will be able to:

1. Create reasonable estimates of required work, resources, durations, and budgets.
2. Create and interpret project schedules using the critical path method.
3. Communicate effectively with others engaged in project planning and control.
4. Create a baseline plan for monitoring and controlling project progress.
5. Understand normal, expedite, and fast-track scheduling strategies, and when to use each.
6. Master the basic vocabulary of the project the management planning process.
7. Be a more effective, collaborative project team member.

I can give you a six-word formula for success: think things through—then follow through.

—E. Rickenbacker

The Work Breakdown Structure

The Work Breakdown Structure (WBS) is a hierarchical process of decomposing the project's goal into the elements of work required to achieve that goal. The WBS helps the team identify every task, event, and achievement needed to realize the project's intended outcomes.

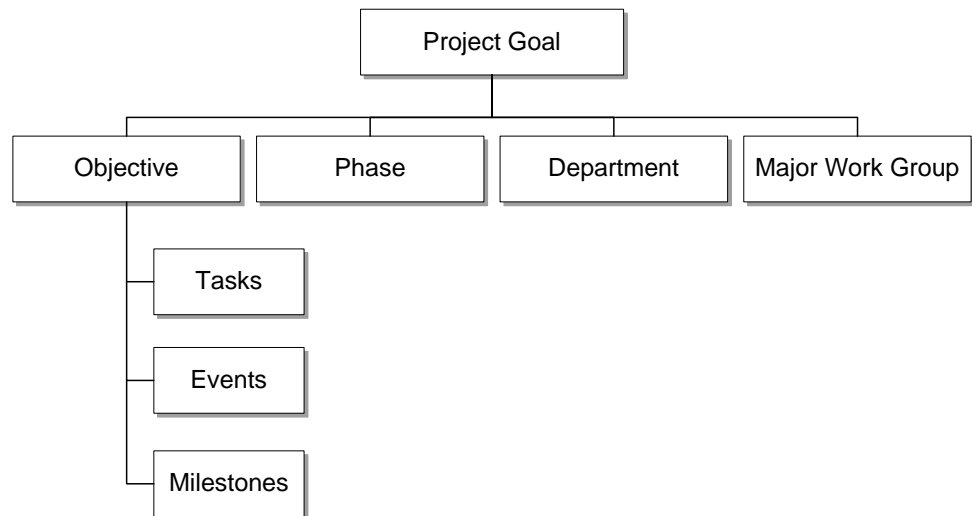
Planning Step #1

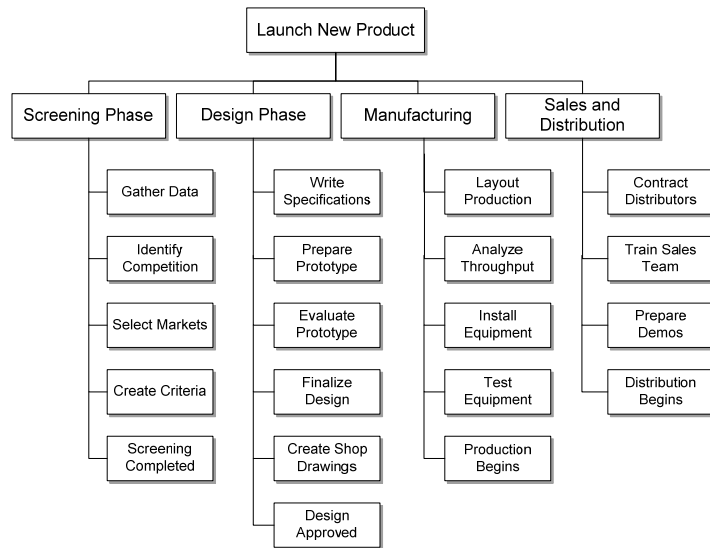
Create an accurate Work Breakdown Structure.

The output of this work will later be used for estimating resource requirements, activity durations, workflow relationships, and ultimately, to create a baseline schedule for the project implementation phase.

Check and double-check all work! Mistakes made in the WBS can ripple throughout the entire project with serious consequences.

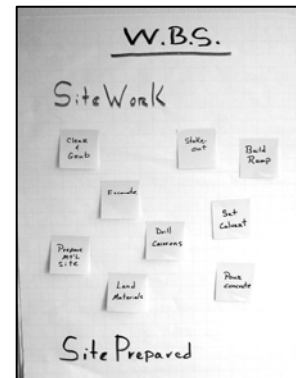
Traditional Org-Chart WBS





Sticky-Note WBS

When working with groups or for some thinking styles, using sticky-notes and an electronic camera provides a rapid mechanism for capturing the WBS elements.



Outlined WBS

The projects hierarchy of work can be effectively communicated using an outline format where each indentation shows a subordinate relationship.

Project goal

Major Objective #1

Phase of work

- Task A
- Task B
- Task C...

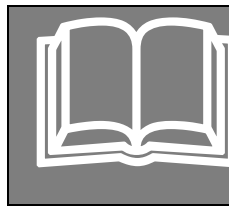
Phase of work completion milestone

Major objective #1 completion milestone

Project goal milestone of completion

As an example, the hierarchy of a product development project when outlined might look like this:

New Product Launch
Design Phase
Write Specifications
Create Prototype
Conduct User Review
Design Approved
Next Phase...
New Product Launch Completed



Definitions—WBS Vocabulary

Establishing a consistent vocabulary and written format for each of the WBS elements will improve your team's ability to communicate effectively. It is also a good idea to establish a consistent WBS numbering system for use in outlines and other project documentation.

Goal

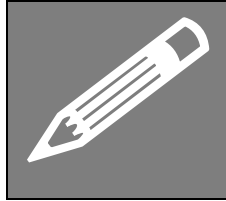
Phase

Activity

Task

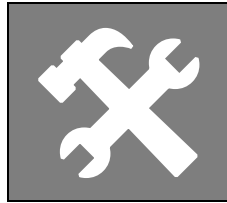
Milestone

Constraining Dates



Exercise—Creating a WBS

Choose a learning partner to work with and create a work breakdown structure for the project assigned by your instructor.



Tool Tips--Creating a WBS

1. Focus on the goal and the triple constraints.
2. Assemble a WBS team.
3. Select a project approach.
4. List summary phases, major milestones, or key objectives.
5. List the required tasks or work activities required.
6. List constraining dates as they become apparent.
7. Organize for ease of communication and review with your team.
8. Ensure that you have identified all important milestones.
9. Validate the approach with the project's goal and triple constraints.

Success Rule #3

Check and double-check the WBS.



Key Concepts--WBS

- The WBS is the first and the single most important step in the planning process.
- The WBS helps validate assumptions.
- Creating the WBS is an iterative, learning process.
- Cross-functional teams are required on complex projects.
- Errors in the WBS can cause fatal flaws in project outcomes.
- A thorough WBS helps prevent errors of omission.
- All further planning relies on the accuracy of the WBS.

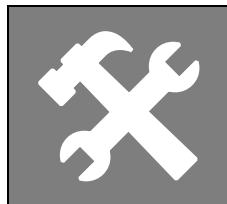
Activity and Task Analysis

Once the individual work units have been identified, the project planner can analyze durations, resource requirements, workflow dependencies, and costs. This step is frequently completed using a Task Analysis Chart as shown below.

Tasks	Duration	Res	Dep/Pred	Cost
Phase 1 Work				
Task A				
Task B				
Task C				
Task D				
Task E				
Phase 1 Completed				

Planning Step #2

Create a Task Analysis Chart to organize the project, your thinking, and your ability to communicate.

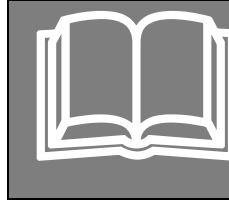


Tool Tip--Task Analysis Charts

Place the phases, tasks, and milestones identified in the WBS on the task analysis chart in as-logical-as-possible sequence. For example, tasks undertaken early in the project should fall higher on the chart than those that will be undertaken in later stages.

When possible, group related tasks between a summary (phase) and its corresponding completion milestone event.

Estimating Task Durations and Resources



Definitions—Duration Estimating

Duration: The time required to complete a task. Durations are usually expressed in standard work-time units such as hours, days, or weeks. Typically, days consist of eight working hours and weeks consist of five working days.

Effort: The number of resources or productive force being applied to the work. Two workers can apply twice as much effort as one worker can.

Work: What is achieved (or needs to be achieved). Work is equal to effort times duration.

Normal: The likely approach, team, procedure, resources, and conditions under which the work will be performed. The most frequent *normal* approach is to maximize efficiencies, minimize risk, and minimize costs. In some organizations and on some projects, *normal* conditions are far from optimal, making projects more difficult, costly, and risk-laden.

DURATION = EFFORT → WORK

or

DURATION = TIME ALLOWED IN SCHEDULE

 Planning Step #3

Estimate task durations with *normal* resources and as accurately as possible.

Duration Estimating Techniques

History

References

Delphi

WAG

SWAG

PERT

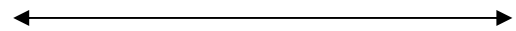
$$T_e =$$

$$T_o =$$

$$T_m =$$

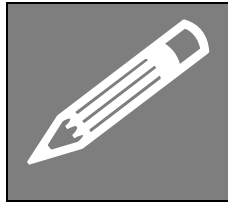
$$T_p =$$

$$T_e = \frac{T_o + (4 * T_m) + T_p}{6}$$



$$\sigma = \frac{T_p - T_o}{6}$$

$$\sigma_{\Sigma T_E} = \sqrt{\sigma_a^2 + \sigma_b^2 + \sigma_{n...}^2}$$



Exercise--Estimating Durations

Team up with a few friends and estimate the durations of the tasks assigned by the instructor. Calculate the total person-hours (-minutes) required to complete the tasks assigned to the team.

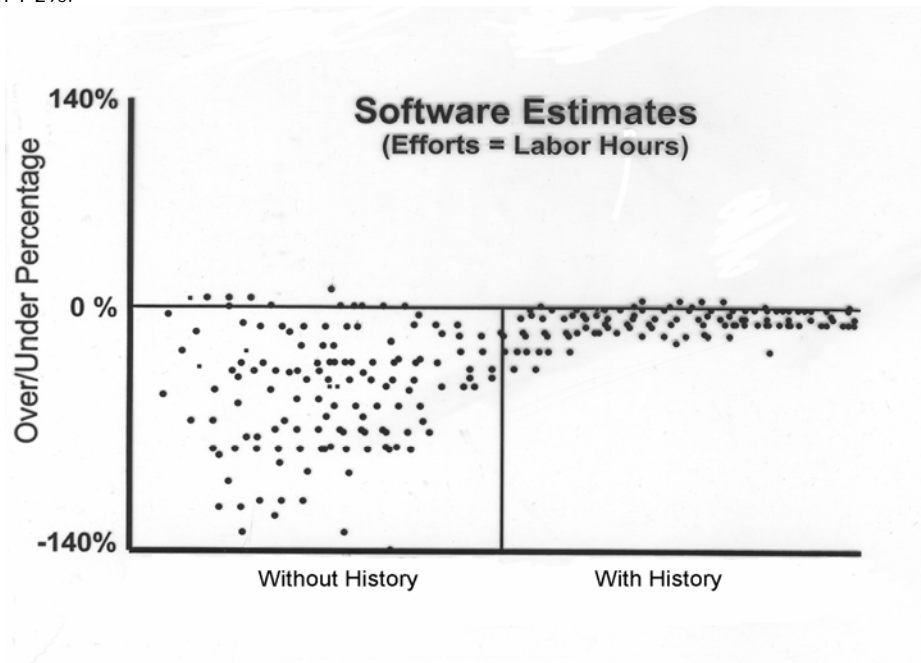
Task	T_O	T_M	T_P	T_E	σ		
Totals							



Revealing Research—Duration Estimates

Your intuition is right—Dr. John Wu at the University of Washington has shown that relying on experience dramatically improves duration estimates, at least in software development. In an analysis of several hundred software projects (most of which were not won by competitive bid) the total project duration was usually overly optimistic—up to 140% off. The better the historic data was, the more accurate the estimated duration was, narrowing the maximum error to around 12%.

Competitive bid project teams tend to achieve better results. When using historic data, known materials and technologies, and experienced teams, project task durations are frequently estimated to within 1-2%.

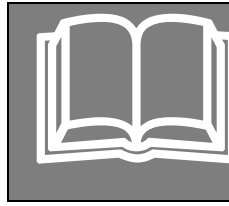


Establishing Workflow

Planning Step #4

Analyze Workflow Dependencies in a safe and simple model.

Project workflow is determined by analyzing each task's relationship with those tasks that immediately precede or follow it. A notation is made in the task chart (usually noting the dependent task's predecessor) to record the determination. The vocabulary of project workflow allows project teams to communicate even complex relationships with ease.



Definitions—Modeling Workflow

Dependent Task

Predecessor Task

Successor Task

Finish to Start (FS)

Parallel Tasks (Concurrent)

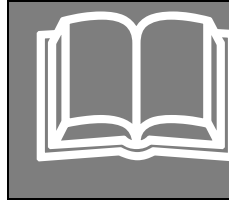
Start to Start (SS)

Lead and Lag

Start to Finish (SF)

Finish to Finish (FF)

Dummy Task



Definitions—the Critical Path Method

Critical path

Slack and float

Success Rule #4

Slack is your friend—
find it, make it,
protect it.

Forward pass

Backward pass

Deadline

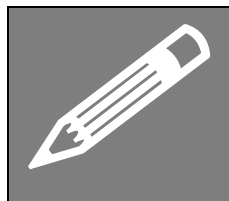


Key Concepts—CPM Benefits

1. Reveals ES, LS, EF, and LF
2. Reveals the critical path
3. Reveals the normal deadline
4. Reveals slack and float
5. Establishes resource requirements
6. Optimizes the use of limited resources
7. Creates an implementation baseline
8. Improves understanding and communication
9. Facilitates start-date management
10. And . . .

Success Rule #5

Manage Start Dates
aggressively.



Exercise: Creating a Gantt & Resource Chart

Team up with a colleague and on the following page: 1) Create a Gantt chart—find the critical path and any slack. 2) Determine the number of resources required each day.

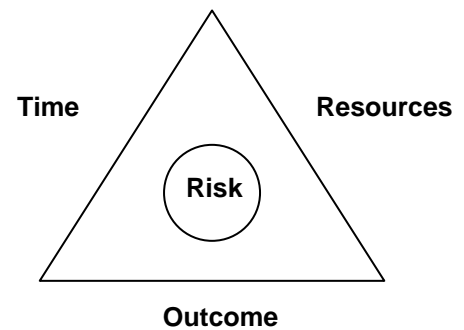
Planning Strategies

Risk, at some level, is inherent in every project. It can be better managed when teams use a common language to discuss risk-management strategies. In essence, the balance of the triple constraints largely determines the amount of risk in any given project.

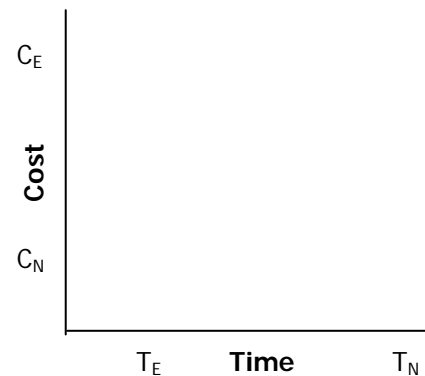
Planning Step #7

Adjust the plan to balance time, costs, outcomes, and risk.

Normal Plans: As described in duration estimating, a plan created with a normal approach maximizes efficiencies, minimizes risk, minimizes costs, and results in a total project duration that is acceptable to the project sponsor. Essentially, the triple constraints (outcome, resources, and time), are in purposeful balance.



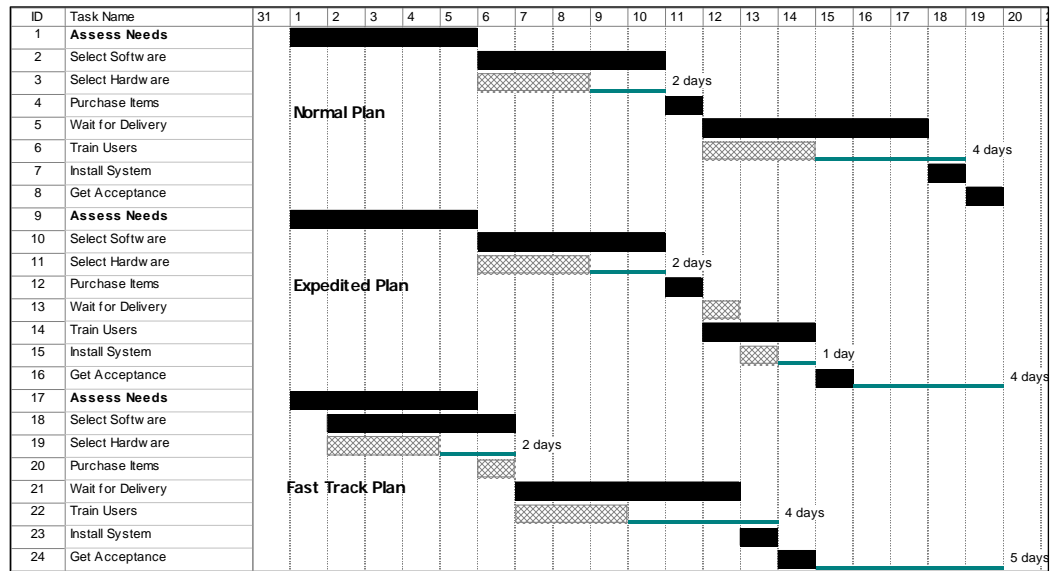
Expedite Plans: Expediting (also known as crashing) changes the balance of the triple constraints—in order to achieve the same outcomes and shorten the duration, additional resources are used. In order to reduce project durations at the least cost, various alternatives are considered.



Fast Track Plans: Fast tracking attempts to reduce project durations while holding resources, costs, and outcomes fixed. The order of work is modified to speed project completion. For example, tasks planned in a normal finish-to-start workflow sequence may be run start-to-start to compress project duration. This approach likely adds to the risk of implementation.

The table and Gantt chart below summarize the effects of each strategy.

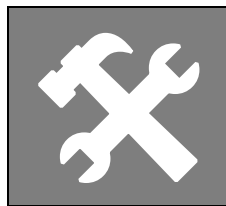
	Duration	Cost	Risk
Normal			
Expedite			
Fast Track			



Planning Step #8

Distribute the baseline plan to stakeholders.

There are numerous implementation approaches for any given project. Balancing time, cost, outcomes, and risk may require creating several plans and comparing the expected results.



Tool Tip—Planning Step-by-Step

1. Create the WBS.
2. Create a task analysis chart.
3. Estimate task durations with normal resources.
4. Analyze workflow dependencies.
5. Create a normal schedule.
6. Level resources if it is necessary.
7. Adjust the plan to balance time, costs, outcomes, and risk.
8. Distribute the baseline schedule.



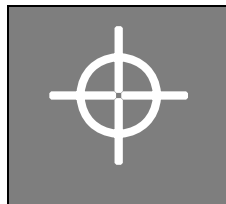
Key Concepts and Assessment of the Approach

Consider the project management approach you used prior to attending this class. Compare it with the approach prescribed herein.

1. List the pros and cons of each approach.
2. What might you now do differently?
3. What changes will likely provide the most improvement?
4. Are there any issues that need to be addressed to make these improvements?

Tracking and Control

Current actuals against a good baseline plan provide the knowledge and the confidence you need to take controlling action.



Section Five Objectives

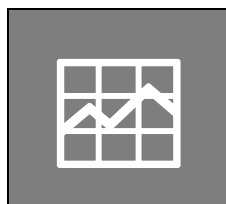
The objectives of this section are to provide the participant with useful control procedures and techniques. At the conclusion of this section, participants will be able to:

- Create and use the seven primary control documents.
- Discriminate between effort and progress.
- Choose which project elements should be tracked.
- Communicate project status effectively to members of the project team, sponsors, supervisors, and others.
- Understand the significance of status assessment.

*You **can't** take corrective action without information.*

*You **won't** take corrective action without information you **trust**.*

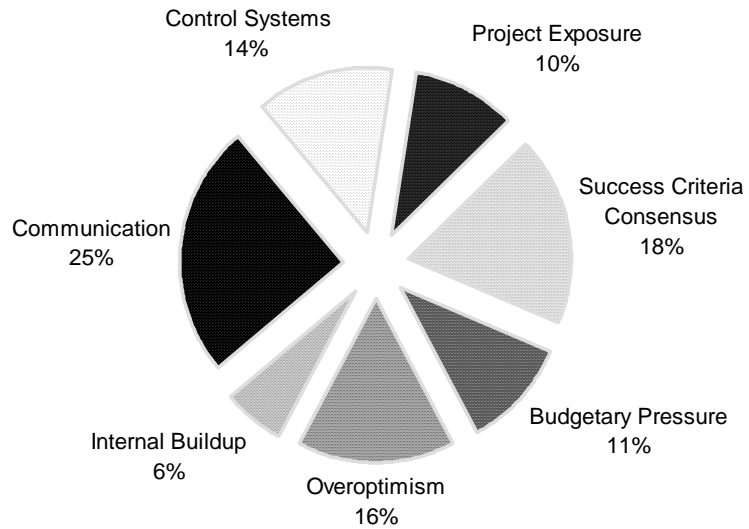
—Ron



Facts and Data—Success / Failure Factors

In a study of 650 projects by Murphy, Baker, and Fisher, factors contributing to project success were tabulated and correlated using regression analysis. A synopsis of their research is shown in the following chart. Taken together, these factors explained 91% of the variance in perceived project success.

Two of the factors had negative effects when present: budgetary pressure and initial overoptimism. In comparison to the five positive factors, these two items accounted for almost a third of the total success/failure influence.



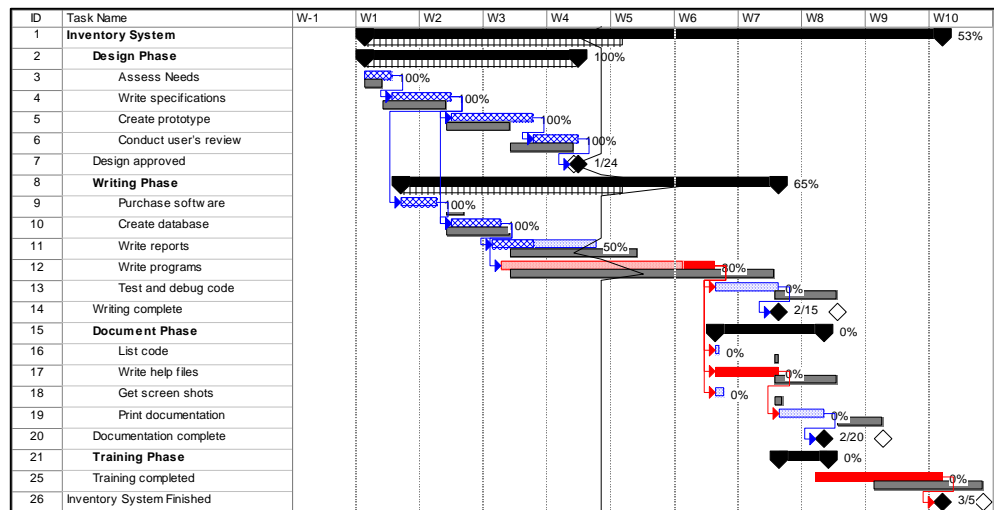
Relative importance of seven project success factors from data collected by Murphy, Baker, and Fisher.

Seven Essential Controls

Success Rule #6

Manage the milestones (results) to manage success.

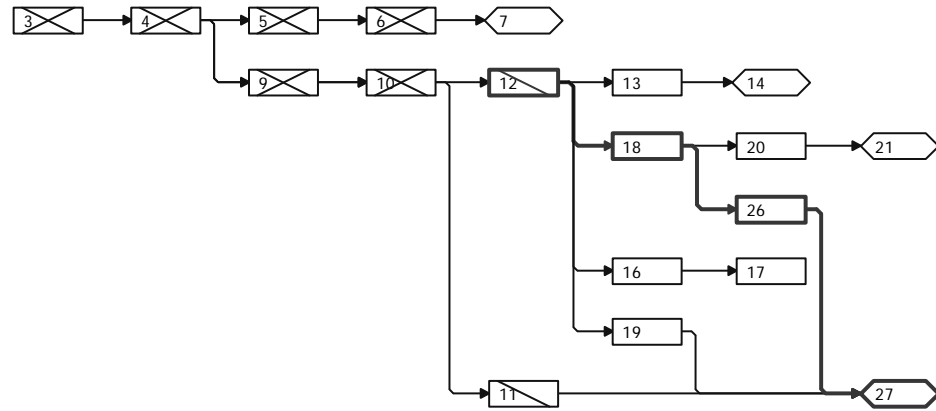
1. Tracking Gantt



The tracking Gantt chart shows actual starts, finishes, durations, and work completed compared to the baseline plan. The chart is a powerful tool for managing project progress. The version above was created using MS Project.

2. Network Diagram (AON)

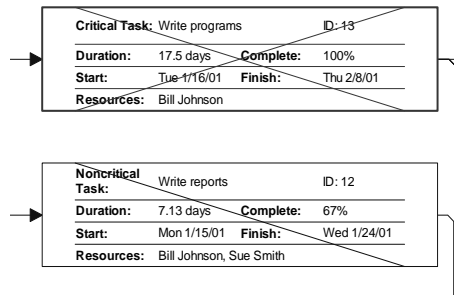
Expediting tasks that precede work bursts can increase slack on all successor paths.



The Activity on Node network diagram provides a good communication tool for tracking overall progress. Completed tasks are crossed out. Tasks started but not completed have a single line drawn through them.

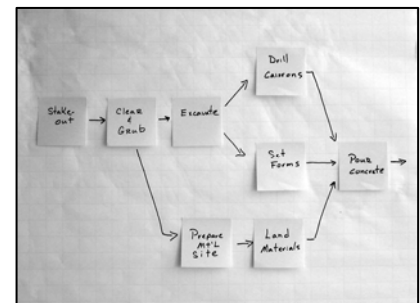
Success Rule #7

Take controlling action sooner rather than later.

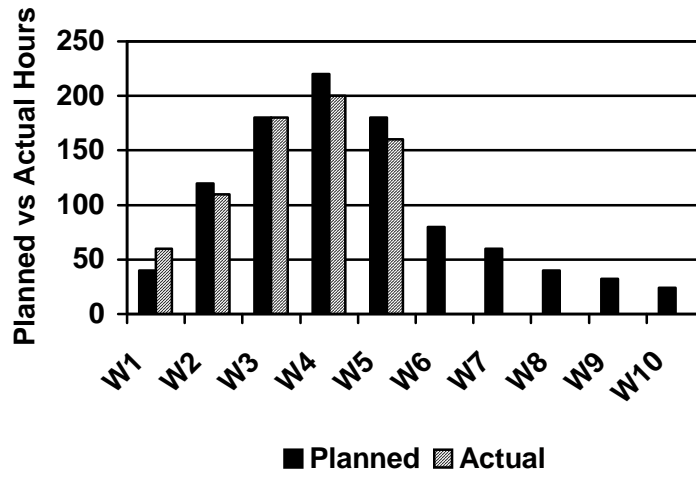


Activity on node charts are effective tracking tools whether they are created with MS Project (shown above) or index cards and sticky-notes (shown below).

ES	Task	EF
		ID
Dep.		Duration
		Cost
LS	Resource	LF

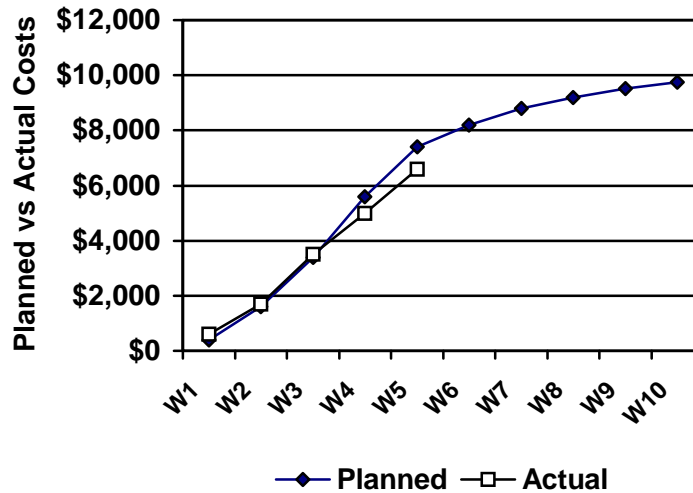


3. Resource Usage Chart



4. Cost Curve

Earned Value analysis adds the dimension of task duration to the cost/value curve.



The cost curve is a time-phased data chart and therefore is often misinterpreted. Be careful how it is distributed.

5. Variance Chart

Task	Duration				Costs			
	Est.	Actu	Var.	%	Est.	Actu	Var.	%

6. Project Journal

A record of important events, meetings, decisions, and project status is an indispensable control tool. The prudent project manager makes concise, daily entries regarding anything that impacts the project. Useful journals have a project-specific format, which includes at least these three categories:

1. Work progress—Who, what, where, resources, status of work, materials, and equipment.
2. Unanticipated problems—What, when, who, results or implications, and notification.
3. Other events—Scope change requests, discussions, resolutions, visitors, and weather.

7. Scope Change Control

Project control is an active process of maintaining progress in a dynamic environment. Good change management allows project teams to respond to both necessary and unnecessary changes with the proper action.

Changes in scope are legitimate when required due to a flaw in the initial plan, new information arises from the project, or environmental changes occur (external or internal) during the life cycle of the project.

Changes in scope are illegitimate when they unnecessarily add to the scope, time, cost, or risk of the project. Scope creep can be deadly to projects and project teams.

Scope Change Content

- Background of Request: Describe why the change is necessary.

Use your digital camera or camera enabled cell phone to help document project status.

- **Approach or Methodology:** Describe how the change will be implemented. Provide a short rationale for the method used and any other methods considered but rejected.
- **Estimated Impact:** Describe the impact of the change on time, budget, resources, and risks to project success. Consider and list possible collateral impact to other projects, resources, or stakeholders.
- **Communication Routing List:** Distribute the approved document to all stakeholders who will be impacted by the change.
- **Attachments:** Include revised schedules, budgets, drawings, specifications, photographs, or any other items needed to clearly communicate.
- **Sign-offs:** The document should be signed and dated by the requestor, sponsor, and the project manager.

A sample scope change document is provided in the Appendix.

MBWA

Collecting data is only half of the job; _____ is the other half.

You can trust what you can observe:

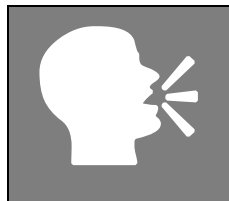
Success Rule #8

Dig for the dirt. You can't fix what you can't find.

Progress

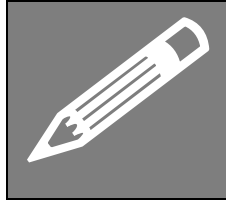
Attitudes

Cooperation



Useful Words

1. Have you _____ ?
2. Have you _____ ?
3. What are the _____ ?
4. _____ ?



Exercise

Discuss with your colleagues how adopting or adapting any of the project management concepts and techniques covered thus far might be useful to your organization or department. For example, you may want to discuss **one** of the following:

- Are there any project management techniques or concepts that you'd like to see applied more consistently in the projects you work on?
- Is there anything you can do to make your **smaller** projects consistently more successful?
- Is there anything you can do to make your **larger** projects consistently more successful?
- How do you plan on applying or adapting any of the concepts and techniques presented thus far to the projects you work on?



Key Concepts

Problem Solving and Troubleshooting

While project problems are seemingly inevitable, most can be avoided, mitigated, or resolved through adequate planning and timely action.



Section Six Objectives

One of the important roles of the project manager is to prevent, avoid, minimize, or mitigate the impact of problems.

The objectives of this section are to provide the inexperienced participant with an overview of the various types of project problems and their relative importance. Upon completion of this section, these learners will be able to describe common strategies and tactics used to deal with problems.

Learners with project management experience will be able to recognize inappropriate project management techniques, discuss the implication to project success, and recommend better approaches.



Exercise—Dealing with Typical Problems

1. Choose a team to work with on this exercise.
2. List two or three typical problems you have personally experienced or expect to experience on your projects.
3. Create a combined team's listing of these typical problems.

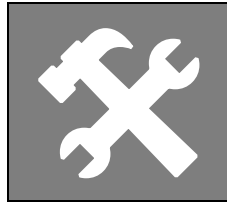
As shown by Murphy, et al, the primary success/failure factors include:

- Insufficient use of progress/status reports.
- Use of superficial status reports.
- Inadequate project manager skills (administrative, human, and technical).
- Insufficient project manager influence and authority.
- Poor coordination with recipient stakeholders.
- Lack of rapport between stakeholder groups.
- End-user or client disinterest in budget criteria.
- Lack of team participation in decision making and problem solving.
- Excessive structuring within project team.
- Job insecurity of project team.
- Lack of team spirit and sense of mission within the team.
- Non-dynamic parent organization, lacking strategic change.
- Poor coordination within the parent organization.
- New "type" of project.
- Higher levels of project complexity encountered.
- Initial under funding, inadequate resource allocation, excessive project portfolio.
- Inability to freeze design early.
- Unrealistic schedules.
- Inadequate change procedures.

Lots of folks confuse bad management with destiny.

—Kin Hubbard

In projects, problems are inevitable —“just enough time and resources” will always fall short.



Tool Tip—Problem Analysis

When issues and problems arise, the team must be able to correctly assess their urgency, importance, and potential impact. This is particularly important during the implementation phase when multiple problems can easily overload available resources and easily impact the project's timeline. At the first sign of a

problem, consider:

1. Will the problem impact the _____?
2. Will the problem impact the _____?
3. What is the solution's _____?
4. _____ will be impacted?
5. What _____ can we break?

The difference between a good manager and a great manager is knowing what you can afford to ignore—then having the courage to do it.

Problem Strategies

In the midst of problems, keep your team focused on the strategy of success. Make sure everyone understands the project's goal(s) and the prioritization of the triple constraints. In order to succeed the project team must:

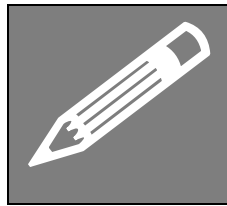
- Achieve the project's goal.
- Protect the driving constraint(s).
- Protect the critical path.
- And when the problem has become divisive or emotional, save the people.

Problem Tactics

The following is a checklist of tactics that can be considered if your project is falling behind schedule. Be careful, each of these tactics may impact outcomes, costs, or quality.

- Shift resources off tasks with slack or float and onto the critical path.
- Create a fast-track project schedule from the current point forward.
- Expedite remaining tasks.

- Add resources.
- Buy instead of making or, make instead of buying.
- Apply incentives or disincentives.
- Substitute alternatives.
- Go for substantial completion and finish non-essentials later.
- Narrow the scope.
- Renegotiate.

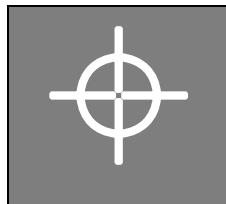


Key Concepts

- Problems are inevitable.
 - Not all problems deserve your attention.
 - Options diminish as time progresses.
-
- To minimize a problem's impact, focus on the goal, protect the driving constraints, and protect the project's critical path.

Staffing and Resources

Even simple projects require a breadth of experience, ability, skills, and expertise. Teamwork is not optional; rather, it is essential to success.



Section Seven Objectives

The objectives of this section are to describe the various roles and responsibilities required within a successful project environment. Participants will be able to list the roles, describe each role's key responsibilities, and organize a team around these principles.

The team approach of organizing around work is driven by many pervasive trends. These include:

- Internal and external demands on productivity and change are forcing more organizations to adopt a project orientation.
- Individual projects are increasingly complex, requiring cross-functional expertise.
- Traditional organizations are giving way to matrix organizations.
- Geographic disbursement of the workforce is broadening.
- Competitive factors, external forces, and technology changes are forcing shorter project lifecycles and at the same time, increasing project complexity.
- Diverse teams and complex projects make communication, coordination, and control increasingly difficult.

*You don't need to know
everything about a project ...*

..if you know who you can trust.

–Ron

Project Stakeholders and Responsibilities

To meet these growing demands, individuals within work groups are embracing the notion of *positive interdependence*, pulling together for the project, the team, and the organization. The primary roles within the project environment are

- Project Originator—the person who comes up with the idea
- Projects Board—a group entrusted with top-level project responsibilities
- Project Sponsor—the person who advocates for the project benefits
- Project Manager—the person who manages the project
- Project Team—the core- and extended-team members who undertake the work

The Originator

This person identified the need for the project and successfully advocated its merits to the appropriate decision makers. This person may come from anywhere within the organization or they may even be a customer, client, end user, or vendor. The originator may have created a proposal or “white paper”.

The Project Board

The group of senior managers (and/or the customer) who ultimately must select, authorize, and prioritize all project efforts to the purposes of the organization’s missions, goals, and objectives.

- Authorizes all project budgets and expenditures.
- Prioritizes projects based on organizational objectives.
- Provides a forum for cross-functional decisions.
- Typically reports to the organization’s senior executive or management team.

The Project Sponsor

This individual works on behalf of the organization, making sure that the benefits to the organization exceed the cost and risk, that there is legitimate justification to undertake the project, and that the project does not detract from the organization’s mission critical activities or negatively impact other departments.

The sponsor must ensure that the project always makes sound business sense.

In addition, the project sponsor advocates for the project and distribution of the organization's resources to it. The project sponsor helps make key decisions at critical points in the project process.

Ultimately, the project sponsor is accountable to the senior executive of the organization, to a project board, or a committee entrusted with top-level responsibility.

- Ensures the project addresses legitimate organizational needs.
- Clearly communicating the project goals and objectives to the project manager and project team.
- Interfacing with and maintaining open communications with the project team, especially during the initiation and planning phases.
- Timely responsiveness to the project manager's requests and inquiries.
- Advocates for the project within the organization.
- Creates the project charter and selects the project manager.
- Resolves issues beyond the project manager's reach.
- Represents the project to the Projects Board.
- Authorizes go-ahead at key stages within the project management process.
- Works with the project manager and department heads to ensure that required resources are available and accessible to the project.
- Initiates project reviews and progress reports.
- Keeps the Project Board advised of project status.
- Monitors and works to minimize adverse impact to other projects, departments, and individuals during the project.

The Project Manager

The project manager is accountable to the project sponsor for the day-to-day operations of the project, supervision of the core team, management of the activities of the extended team, and is ultimately responsible for the on-budget, on-time, on-specification completion of the project's deliverables.

Success Rule #10

When given responsibility without authority, take it, make it, or if you must... fake it.

- Creates a viable project plan with appropriate detail in support of the project sponsor's goals, objectives, budget, timeline, and resources.
- Assembles the project team with the support of their managers.
- Assigns project roles and responsibilities to the project team.
- Manages project progress, budgets, quality, issues, risk, opportunities, changes, scope, and communications.
- Maintains a normal state of forwardness throughout the project.
- Prepares project documentation and reports as required.
- Keeps the project sponsor informed of important issues, events, risks, and overall project status.
- Completes the project's deliverables within budget, on time, and on-specification.
- Manages the closure of the project.

The Project Team

The project team is those individuals, vendors, or subcontractors who do the work.

The core team is generally considered to be the dedicated staff who reports directly to the project manager. These individuals likely spend most or all of their time on the project, however they may have shared responsibilities or only contribute a percentage of their time to the project. The key point is that they report directly to the project manager.

The extended team does not report to the project manager. They generally dedicate only a fraction of their time to the project. Coordination and control of these resources can be difficult depending on their workloads, attitudes, and the organization's culture.

Project team members are accountable for the delivery of specific work units. Their responsibilities might be comprised of a single task or an entire section of the project. In any case, every element of the project should have a single-point of responsibility.

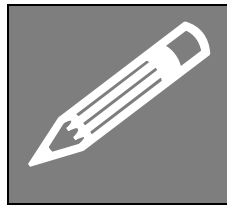
- Has a clearly defined role and specific responsibility for which they are accountable to the project manager.
- Operates within the schedule, budget, and specifications for their work units.

Use your best people on projects—they're creating the future of your organization.

-
- Keeps the project manager informed of issues, risks, and overall status of their responsibilities.
 - Coordinates and interfaces with other members of the project team as required.
 - Authentically contributes to and participates in the planning of the project.
 - Responds to status reports and review inquiries.
 - Maintains a state of forwardness in their assigned roles.

Predicting (and Avoiding) Team Problems

In projects it is often necessary to assemble a group of technically diverse (and often geographically dispersed) individuals who have little or know experience working together. Many of the difficulties and potential problems within a team are easy to predict...and can sometimes be easy to avoid.



Exercise—Predicting and Avoiding Team Problems

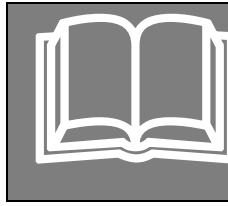
From your experience, list the types of problems you might expect when assembling a new team from your typical resources.

Originator (one of your primary customers)

Sponsor (upper management)

Core team (co-workers, subject matter experts, subordinates, and peers)

Extended team (vendors, remote co-workers, etc.)



Definition—Team

A team is a small group of people with complementary skills who are committed to a common purpose, common goal, and common approach, for which they hold themselves mutually accountable. The primary purpose of the team approach is to improve achievement. Of course, not all teams operate at high levels of performance, all the time. On average, how does your work group perform? Is there room for improvement?

Project Team Essentials



Facts and Data

Much has been written about the various roles performed in effective teams—facilitator, organizer, initiator, etc. According to Belbin's (1996) research on project teams, required roles are most likely performed when individuals on the team possess requisite styles and skills before joining the team.

In other words, staff the team with individuals who will naturally perform required roles. Managers seldom have the luxury of choosing all the team members, but when possible, populate your team with complementary styles and skills.

According to Belbin, project teams are more likely to succeed when they have among their members:

A successful chair—(a project manager) patient yet commanding, generates trust, looks for and knows how to use ability in others.

*Groups become teams through disciplined **action**. They **shape** purpose, **agree on goals**, **define** approaches, **develop** skills, and **hold** themselves accountable.*

—Jon R. Katzenbach (1993)

Creative people—at least two very clever and creative individuals, so that ideas can be matured through discussion and collaboration.

Others of diversity—the remaining team members should have a wide range of abilities and strengths, secondary work flexibility, and have a good match between their individual abilities and roles.

- Belbin's research indicated that a single unbalancing change in a project team could have a momentous effect (positive and negative) on the project and on

the organization as a whole. Timely, accurate information—ideas must flow smoothly throughout the entire matrix.

- No surprises—communication must be consistently complete and candid.
- Credit given where credit is due—a sense of fairness must permeate the entire matrix.
- All stakeholders are authentic—trust and respect reigns supreme.

Success Rule #11

Champion all people.

Selecting a Project Manager

One of the most important decisions a project sponsor must make is the selection of an effective project manager. Research and experience indicates that the following criteria are essential:

- Personal ambition and motivation. Enthusiasm, though difficult to gage, consistently proves to be a precursor to successfully negotiating the inevitable challenges that befall every project manager. Without a positive, unstoppable attitude, your project manager at best will be unable to lead others and at worst won't survive the job.
- High tolerance for ambiguity. In projects, authorities are rarely clear cut and absolute authority is non-existent. Project managers must be able to cope with unclear requirements, uncertain results, and untested team members for stakeholders who constantly reevaluate their expectations.
- Good coalition and team building skills. Gaining results in difficult situations, across department lines, without direct reports and clear cut authority requires a consummate coalition builder.
- Technical competence. While project managers don't have to know everything about project management or the technologies embodied within the project, technical competence improves their ability to judge the merit of conflicting views, relate to the project team, and make timely decisions.
- Business orientation. The ability to weigh a multitude of factors, maintain a focus on objectives, and understand the impact their decisions have on many parts of the organization is fundamental in growing and maintaining a robust organization.
- People skills. The ability to identifying interests, motivations, strengths and weaknesses of others. In the final analysis, project managers lead others to success. Communication, motivation, commitment building, and the ability to know who to trust are essential project management skills.

Although most workers flourish in teams, a limited few will be unfit for the team environment.

Top Job Satisfaction Factors

Dr. Sheldon of the University of Missouri-Columbia reported in the February 2001 issue of the *Journal of Personality and Social Psychology* his original research findings on motivation in the workplace. The research underscores what most good team leaders already know: To build a good team, act to enhance positive-interdependence (we sink or swim together) and that which promotes the individual's job satisfaction.

A _____

C _____

R _____

S _____

Not surprisingly, Sheldon identified four of the top five job dissatisfaction factors as lacking any of the above. The fifth dissatisfaction factor was lacking job security.

Three Steps to Building Better Teams

1. Establish Team Goals

- Acknowledge the natural fears: failure, success, accountability, and responsibility.
- Embrace diversity.
- Reinforce the concept of positive interdependence.
- Discuss the team's purpose and how it relates to the organization as a whole.
- Decide on the team goal(s).
- Explore "What's in it for me?"

Don't try to build good teams to improve performance...

Rather, focus on building performance and good teams will emerge.

Effective team leaders facilitate effective communication at all levels.

2. Establish Team Rules

- Facilitate open discussion on: “The things I like and dislike about working on a project team.”
- Brainstorm and discuss “What ground rule(s) would make our project team an even better place to work?”
- Gather the ideas, discuss each, and seek consensus.

*If anything goes bad, I did it.
If anything goes semi-good, we did it.
If anything goes real good, you did it.*

—Paul Bryant

3. Establish Roles and Responsibilities

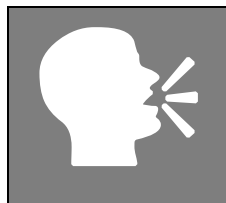
- Acknowledge that everyone makes a meaningful contribution.
- List all tasks or functions (use the WBS).
- Establish priorities and methods (use the project planning documents).
- Facilitate involvement and willing commitment to the team, the project, and to the intended results.
- Balance the load.

The price of greatness is responsibility.

—Winston Churchill

Success Rule #12

Practice single-point responsibility. It is the basis for individual commitment and project team success.



Useful Words

How do you see yourself best contributing to this project?

What do you suggest?

Nice job!

What's your point of view?

Yes, and...

Who's responsible for that?

What are you going to do about that?



Key Concepts

- The project management process enables team building by facilitating the setting of goals, the understanding of roles and responsibilities, and by improving communication and commitment.
- The human side of a project is at least as important as the technical side of a project.
- Projects are a team sport and like any team sport, many individual strengths and skills are required.
- Effective teams insure that everyone makes a meaningful contribution.

Glossary

Activity An element of work (task) which must be accomplished to complete the project.

Activity Duration The number of work periods needed to accomplish an activity. Usually measured in hours, 8-hour days, or 40-hour weeks.

Activity-On-Arrow (AOA) A network diagramming method that uses arrows to represent activities.

Activity-On-Node (AON) A network diagramming method that uses nodes or boxes to represent activities. Often referred to as a network diagram.

Actual Cost of Work Performed (ACWP) The total of all costs incurred during a given time period.

Actual Finish Date (AF) The date work on an activity was completed.

Actual Start Date (AS) The date work actually started on an activity.

Administrative Closure Formally closing the project in accordance with the organization's documentation procedures.

Arrow The link between tasks in a network diagram that shows the sequence of workflow.

Arrow Diagramming Method (ADM) A network diagram where activities are shown as arrows.

As-of Date The date the data was collected.

Backward Pass Calculating the dependent task's late start date by subtracting its duration from the successor task's late start date.

Bar Chart A network diagram of activities where the tasks are listed down the left side and activity duration is shown as a horizontal bar scaled to the length of the activity. Also known as a Gantt chart or time-line chart.

Baseline The scheduled dates, durations, resources, and costs according to the plan used to implement the project and monitor progress.

Baseline Finish Date The originally scheduled finish date.

Baseline Start Date The originally scheduled start date.

Budget At Completion (BAC) The planned total cost (baseline cost) of the finished project.

Budgeted Cost of Work Performed (BCWP) The total value of activities actually completed with a given period according to the planned costs.

Budgeted Cost of Work Scheduled (BCWS) The total value of activities as planned for a given period.

Calendar The methodology used to schedule workdays, shifts, resources, tasks, and the project as a whole. There are four calendar types in Microsoft Project 2000: base, project, resource, and task.

Change in Scope A change in the goals, objectives, or content of the project after implementation has begun.

Chart of Accounts An accounting numbering system used to relate project costs to the organization's financial control system.

Charter The responsibilities and authorities assigned to the project.

Contingencies An allowance set aside for potential problems to mitigate risk.

Contingency Planning A planning technique used to identify and mitigate potential problems.

Control Measuring, evaluating, and taking action based on actual performance compared to the planned performance.

Cost Estimate The total of direct and indirect expenses required to achieve project activities.

Cost Performance Index (CPI) Budgeted costs divided by actual costs (BCWP/ACWP). Sometimes used to predict project's completed costs.

Cost Variance (CV) The difference between actual and estimated costs of an activity.

Crashing Shortening the duration of a task or project by any means available. Usually increases costs. Also known as expediting.

Critical Activity Any activity that is part of the longest sequence of tasks from project start to project end. If the completion of a critical activity is delayed, the total duration of the project is delayed.

Critical Path. The series of tasks in a network diagram that requires the most time to complete. Activities on the critical path have zero slack or float.

Critical Path Method (CPM) A project scheduling technique where the duration of the longest complete series of tasks from project start to project completion is used to predict project duration.

Deliverable Any specific, measurable project accomplishment or outcome.

Deadline The project's finish no later than constraining (FNLIT) date.

Dependency Term used to describe the relationship between two or more activities or tasks.

Dummy Activity A drafting convention used as a placeholder to show a logical relationship in an activity-on-node or activity-on-arrow diagram, but where no duration is planned. Also used to describe a task that requires no work or resources other than time.

Duration (DU) The number of minutes, hours, weeks, or months required to complete an activity.

Early Finish Date (EF) The earliest possible date an activity can be completed based on the schedule.

Early Start Date (ES) The earliest possible date an activity can start based on the schedule.

Earned Value (EV) The total cost of work calculated by comparing planned work for a period against actual work accomplished.

Effort The amount of work units needed to complete an activity.

Estimate A forecast of cost or duration for an activity.

Estimate At Completion (EAC) The expected total cost of an activity or project when finished.

Estimate To Complete (ETC) The expected additional cost needed to complete an activity or project.

Event-on-Node A network diagramming technique where activities are shown as nodes or boxes and workflow logic is shown with arrows. The original Program Evaluation and Review Technique used event-on-node technique to diagram workflow.

Expedite Shortening the project's duration by any means available without changing the workflow logic. Usually increases costs.

Fast Track Shortening the project's duration without increasing costs. Usually relies on changing workflow logic. May increase risk.

Finish Date The actual, planned, estimated, early, or late date an activity is to be completed.

Finish-to-Finish (FF) The workflow logic between two tasks where the dependent task may not finish until its predecessor task is finished.

Finish-to-Start (FS) The workflow logic between two tasks where the dependent task may not start until its predecessor task is finished.

Float The amount of time a task may be delayed without pushing out the project finish date. Also called slack.

Forward Pass The calculation of the early start and early finish dates of all activities in the network diagram.

Free Float (FF) The amount of time a task can be delayed without pushing out the start of any immediately following activities. Also called free slack.

Free Slack See free float.

Gantt Chart A network diagram of activities where the tasks are listed down the left side and durations are shown as a horizontal bar scaled to the length of the activity.

Lag Describes the delay of a successor task from its predecessor's start or finish.

Late Finish Date (LF) The latest a task may finish without delaying the project's finish date.

Late Start Date (LS) The latest a task may begin without delaying the project finish date.

Lead Describes the accelerated start of the predecessor task from its successor's start or finish.

Leveling The process of effectively allocating resources to tasks.

Link The arrow that shows the logical work sequence relationship between tasks.

Logic The workflow sequence.

Logic Diagram A project's network diagram.

Logical Relationship The workflow logic between two project tasks or activities (the predecessor and the dependent tasks) described as a finish-to-start, finish-to-finish, start-to-finish, or start-to-start relationship.

Milestone A point in the network diagram that shows significant accomplishment.

Monitoring Collecting progress information for judging progress against the plan.

Network Logic The workflow sequence as shown by a network diagram.

Network Path Any series of tasks in a network diagram.

Normal Plan A term used in the project management methods as espoused by Ron Black, as a plan created under conditions that are typical for the organization. Ideally, these conditions maximize effectiveness while minimizing costs, duration, and risks.

Overlap See lead and lag.

Noncritical Task Any task or activity that does not fall on the longest (critical) path.

Path A series of activities in a network diagram.

Percent Complete (PC) Estimate of progress derived by comparing the amount of work completed with the amount of work planned for an activity or project.

PERT Chart An activity on node chart used to show workflow logic. Strictly speaking, a critical path scheduling method using the Program Evaluation and Review Technique of weighted average duration estimates.

Phase A major sub-unit of a project's work or set of project deliverables.

-
- Planned Finish Date (PF) The scheduled finish date of the project.
- Planned Start Date (PS) The scheduled start date of the project.
- Precedence Relationship The description of two or more task's workflow sequence.
- Predecessor Activity The task which immediately precedes the dependent task.
- Program Evaluation and Review Technique (PERT) A critical path method of scheduling a project using the weighted average method to estimate durations.
- Project The implementation of a strategy to create a specific, measurable outcome.
- Project Charter The document that authorizes a project manager to utilize the organization's resources in a project.
- Project Management The process of undertaking and completing a course of action to meet the stated goals and objectives of an endeavor.
- Project Manager (PM) The person responsible for planning and implementing the project.
- Project Network Diagram A diagram showing the workflow sequence of all tasks required to complete a project.
- Remaining Duration (RDU) The amount of time required to complete a task.
- Request for Proposal (RFP) A non-binding solicitation for proposals from potential vendors.
- Request for Quotation (RFQ) A non-binding solicitation for quotation typically based on the project's specifications or equals therein.
- Resources All the people, equipment, materials, and money required to complete a project.
- Resource Leveling Applying available resources to a project to determine task start and finish dates, project duration, and resource utilization rates.
- Resource Planning Estimating the people, equipment, and material resources required to complete a project.
- Risk Assessment Evaluating potential risks and their affect on the project.
- S-Curve The graph of cumulative project expenditures plotted against time.
- Schedule Performance Index (SPI) The work performed compared to the work scheduled (BCWP/BCWS).
- Schedule Variance (SV) The actual versus the planned cost, duration, work, or percentage complete of an activity.
- Scheduled Finish Date (SF) The date the task was to be completed according to the plan.
-

Scheduled Start Date (SS) The date the task was to be started according to the plan.

Scope The description of the project's intended breadth and depth.

Scope Change Alterations in the project's goals or objectives at any time after the project has been initiated.

Slack The amount of time a task or path can slip without causing the project to finish late. See float.

Stakeholder An individual or group that can impact the project or can be impacted by the project.

Start Date The actual, planned, early, late, or baseline date a task is scheduled to begin.

Start-to-Finish (SF) The workflow logic between two tasks where the dependent task may not finish until its predecessor task has started.

Start-to-Start (SS) The workflow logic between two tasks where the dependent task may not start until its predecessor task has started.

Successor Activity The activity that follows a predecessor activity.

Task An element of work which must be accomplished to complete the project. Also known as an activity.

Target Finish Date (TF) The baseline date that work is scheduled to finish.

Target Start Date (TS) The baseline date that work is scheduled to start.

Total Float (TF) The amount of time a task or path can be delayed without delaying the completion of the project.

Triple Constraints The interrelationship of a project's time, cost, and performance elements. Understanding their relative importance facilitates decision making and problem solving. Usually described as a driver, middle, and weak constraint.

Work Breakdown Structure (WBS) The decomposition of the project's goals and objectives into increasingly detailed units of work, eventually identifying all tasks, activities, work packages, phases, and milestones that are essential to the project's successful completion.

Appendix

Scope Change Request

To _____ From _____

Project _____

Background of Request _____

Approach or Methodology _____

Estimated Impact _____

Communication Routing List _____

Attachments _____

Requested by _____ Date _____

Sponsor Approval _____ Date _____

Other Approval _____ Date _____

Project Manager Approval _____ Date _____

Statement of Work

Project

Purpose Statement

Prioritized Objectives

Key Outcomes and Deliverables

Scope of Work and Limits

Working Assumptions

Known Constraints

Preliminary Cost Estimate

Preliminary Estimate of Resource Requirements

Key Stakeholders and Roles

Project Authorization

Date

Project Charter

Project Date

Purpose, Scope, and Objectives

Defining Conditions, Constraints, and Assumptions

Project Manager Designation, Responsibility, and Authority

Budget Sources and Uses

Project Personnel / Core Team Members / Steering Committee

Communication and Reporting Requirements

Project Authorization Date

Project Concept Checklist

Project

Originator

Sponsor

Project Manager

Project Summary - Major objectives, scope, and relevant background information.

Business and Strategic Fit

- Is the strategic fit clear?
 - Is the opportunity attractive?
 - Will the organization's mission, goals, and objectives be served?
-

Accountabilities

- Has a project sponsor been identified for the investigation phase?
 - Has a project manager been assigned for the investigation phase?
-

Operations and Implementation

- Will the project resource requirements fall within the current organization's capabilities?
 - Will the project's technical requirements fall within the current organization's capabilities?
 - Is the technology feasible?
 - Is there access to additional funding for this project?
-

Describe Potential Risks or Issues

Recommended Action (kill, revise, proceed)

Authorized by

Date

Project Initiation Document

Project

Date

Goal Statement and Scope of Work

Business Case / Project Validation

Objectives

Related Deliverables

Time Frame

Project Assumptions

Triple Constraint Ranking: Importance <-----> Flexibility

Time:

Resources:

Outcomes:

Threats / Risks / Opportunities

Sponsor Approval

Date

Project Manager

Date

Preplanning Checklist

Project _____

FNLT date _____

Goal Statement (SMART)

- Reviewed and agreed upon by key stakeholders.
- Is clearly realistic.
- Is realistic if:

Key Objectives

- Is agreed upon by all stakeholders?
- Do they fall within our areas of competency?
- Is there a priority within the objectives?
- Can they be broken out into smaller stand-alone projects?
- Are there other objectives that might deliver the same results?

Assumptions

- Have assumptions been listed and discussed by all significant stakeholders?
- Should contingencies be identified and included in the planning process?

Triple Constraints

- Is there agreement on the prioritization of the triple constraints by all stakeholders?
- Is there sufficient flexibility in the triple constraints?
- Is control of the triple constraints negotiable?
- Are the resources required in abundance, adequate, or scarce?
- Is there access to additional funding for this project?
- How flexible is the timeline?

Risks

- Have risks and potential issues been candidly discussed by all stakeholders?
- If this project fails or cannot proceed, have options been identified?

Staffing and Administration

- Will existing administrative systems suffice for this project?
- Will resources be dedicated, part-time, or contracted?
- Are all lines of authority and responsibility clear to this point?

Prepared by _____

Date _____

