



Project Management Techniques for Engineers – Part 2

Florida Board of Professional Engineers

Approved Course No. 0010329

4 PDH Hours

A test is provided to assess your comprehension of the course material – 24 questions have been chosen from each of the above sections. You will need to answer at least 17 out of 24 questions correctly (>70%) in order to pass the overall course. You can review the course material and re-take the test if needed.

You are required to review each section of the course in its entirety. Because this course information is part of your Professional Licensure requirements it is important that your knowledge of the course contents and your ability to pass the test is based on your individual efforts.

Course Description:

This course is intended to provide professional engineers with some basic techniques that will improve the way you manage projects. You may or may not hold the official title of “Project Manager” but chances are as a PE you will be called upon sometime in your career to lead a project. And whether that project is big or small, complex or simple, the project fundamentals are the same. This course is NOT intended to be a study guide for taking the Project Management Professional (PMP) Exam but WILL introduce you to many of the principles outlined in the Project Management Body of Knowledge (PMBOK Guide). This course will introduce to you, or maybe reinforce, some key project management practices that will help your projects be more successful.

NOTE: This course was originally provided as a 4 PDH Project Management Course. The course content has now been revised and enhanced to provide additional discussion on the People Side of Project Management (the “Soft Skills”) The two part course now is 8 PDH total – Part 1: 4 PDH; Part 2: 4 PDH.

This is Part 2 (4 PDH) of a two course series and covers:

1. Project management basics
2. Soft Skills for Project Managers
3. Making the Right Assignments (Team Members)
4. Identifying Project Stakeholders – Who’s Who on the Project
5. How to Build Highly Effective Teams
6. Project Structure – The Matrix

In Part 1 (4 PDH) of the series the following is covered:

1. Project management basics
2. Project planning techniques
3. Shoring up the schedule
4. Building the right schedule
5. Budgeting
6. Managing Risk
7. Earned Value

How to reach Us ...




If you have any questions regarding this course or any of the content contained herein you are encouraged to contact us at Easy-PDH.com. Our normal business hours are Monday through Friday, 10:00 AM to 4:00 PM; any inquiries will be answered within 2 days or less. Contact us by:

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Refer to Course No. 0010329,

Project Management Techniques for Engineers – Part 2

How the Course Works...

What do you want To do?	 LOOK For This!
 Search for Test Questions and the relevant review section	 Q1 Search the PDF for: Q1 for Question 1, Q2 for Question 2, Q3 for Question 3, Etc... (Look for the icon on the left to keep you ON Target!)

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TEST QUESTIONS

Q1. [Section I: Project Management Basics] Projects sometimes fail for obvious reasons and sometimes for more subtle reasons. Which of the following is an obvious reason for project failure:

- A. the project comes in over budget
- B. the project schedule is delayed beyond a required start date
- C. the project only meets 4 out of 5 quality criteria
- D. All of the Above

Q2. [Section I: Project Management Basics] During which stage of a project is it best to have Frequent Monitoring and Controlling functions in place:

- A. Project Initiation
- B. Project Planning
- C. Perform the Work
- D. Project Close-Out

Q3. [Section I: Project Management Basics] As PM you are being asked to lower the cost of a project without reducing the project scope. Which is a feasible option under the Triple Constraint discussion:

- A. Shorten the project schedule and allow the team to work overtime
- B. Shorten the project schedule and keep the manhour costs the same
- C. Lengthen the project schedule and eliminate planned overtime
- D. Lengthen the project schedule and keep the manhour costs the same

Q4. [Section II: Soft Skills] Soft Skills are best defined as:

- A. People Skills
- B. Technical Skills
- C. Administrative Skills
- D. Software Skills

Q5. [Section II: Soft Skills] Active Listening is a soft skill a project manager could use to enhance communication within a project team. Which is a degree of Active Listening:

- A. Repeating
- B. Paraphrasing
- C. Reflecting
- D. All of the Above

Q6. [Section II: Soft Skills] If you discover there is destructive conflict within your project team, all of the following are approaches that can be used to resolve the conflict EXCEPT:

- A. Remove designated members from the team
- B. Have the team take a break from the work
- C. Ask one or two team members to step aside and discuss the problem
- D. Ask one or two team members to suggest an approach to address the conflict

Q7. [Section II: Soft Skills] List some ways a project manager could align the team towards the project vision:

- A. Through Delegation
- B. Through coaching and motivation
- C. Leading by example
- D. All of the Above

Q8. [Section II: Soft Skills] An important project management Soft Skill is demonstrating your personal professionalism and ethics through:

- A. demonstration through knowledge, skills, and behavior
- B. creating standards for ethical behavior for oneself and living by these standards
- C. B and C
- D. None of the Above

Q9. [Section II: Soft Skills] A project manager continually works to build trust within the project team. You would expect the communication within the team to be:

- A. easy, open and honest
- B. difficult and cumbersome
- C. lacking innovation
- D. with hidden agendas

Q10. [Section II: Soft Skills] Which Decision Making technique uses consultation with team members to find the most rational decision that is in the best interest of the project:

- A. Command
- B. Consultation
- C. Consensus
- D. Coin Flip

Q11. [Section II: Soft Skills] Common Negative Behaviors that may inhibit your ability to lead a project effectively include ALL of the following EXCEPT:

- A. Balanced Communication
- B. Neglecting some Stakeholders
- C. Failing to Check Assumptions
- D. Blind Focus on Technicals

Q12. [Section VI – Making the Right Assignments] Your project team will be made up of individuals with unique interests and skills. What is a tool you can use to help identify gaps or vulnerabilities in your project team and their project assignments?

- A. Skills Matching Tool
- B. Skills Matrix
- C. Skills Interest Tool
- D. Skills Level Tool

Q13. [Section III – Making the Right Assignments] Assigning a team member to a project does not realistically mean you can expect a consistent work output for 40 hours per week, 52 weeks per year. When looking at an individual's productivity (how much they can produce per unit time) all of the following IMPROVE productivity EXCEPT:

- A. Better knowledge of the task
- B. Advanced computer systems
- C. Previous work experience
- D. Individual Availability

Q14 [Section III – Making the Right Assignments] Which would be an effective method to MEASURE individual team member efficiency:

- A. Report non project specific work on the time sheets
- B. Provide additional project specific training
- C. Provide better available equipment
- D. Staff the project team with those that have prior experience

Q15. [Section III – Making the Right Assignments] Name a tool you can use to ensure your team can meet multiple project commitments by deciding WHEN to allocate work efforts on each project activity.

- A. Resource Matrix
- B. Resource Histogram
- C. Activity Matrix
- D. Work Effort Chart

Q16. [Section IV – Who’s Who on the Project] You have identified 4 main project stakeholders and have ranked them in order of their Power Level and their Interest in the project as follows: Jason: Project Champion; Luke: Staff Accountant and available to answer questions as needed; Jill: Sr. Manager of close functional department (potential beneficiary of the project); Tammy: Shift worker and designee from Operations teams that will use the system once complete. Which of these stakeholders needs to be monitored less closely and really only needs informational posts about the project itself?

- A. Jason
- B. Luke
- C. Jill
- D. Tammy

Q17. [Section IV – Who’s Who on the Project] You need a HIGH level of involvement from your Project Champion at close-out of your project. What is a risk of not having your Project Champion involved:

- A. Lack of full approval of project results
- B. Lack of realistic input for future projects
- C. Lack of technical guidance for the project
- D. Loss of interest by the project team

Q18. [Section IV – Who’s Who on the Project] In the Planning Stage of a Project, what level of involvement is expected of Project Supports for the technical guidance:

- A. None
- B. Low
- C. Medium
- D. High

Q19. [Section V: How to Build Effective Teams] Setting SMART goals for the project team would include goals that are SPECIFIC, MEASURABLE, ACHIEVABLE:

- A. Responsible
- B. Transparent
- C. B and C
- D. None of the Above

Q20. [Section V: How to Build Effective Teams] A method to deliver clear and consistent communication amongst team members may include all of the following EXCEPT:

- A. one on one discussion
- B. regular newsletters
- C. status reports
- D. group meetings

Q21. [Section V: How to Build Effective Teams] What is the most important trait of a successful project team:

- A. highly structured
- B. good communicators
- C. charismatic team members
- D. problem solvers

Q22. [Section VI: The Matrix] A Matrix organization structure is often used in project management because:

- A. it blends the product of the project and the management functions
- B. it blends technical functions and project functions
- C. it blends the product of the project and the technical functions
- D. it blends technical functions and the management functions

Q23. [Section VI: The Matrix] The Matrix Organization makes efficient use of resources such as:

- A. part time use of team members
- B. split use of machinery and equipment
- C. split use of facilities
- D. All of the Above

Q24. [Section VI: The Matrix] The Matrix Organization would be best used on what type of project:

- A. projects that are small
- B. projects that are large and complex
- C. projects that are geographically dispersed
- D. projects that are construction related

END OF TEST QUESTIONS

You may or may not hold the official title of “Project Manager” but chances are as a PE you will be called upon sometime in your career to lead a project. And whether that project is big or small, complex or simple, the project fundamentals are the same. This course is NOT intended to be a study guide for taking the Project Management Professional (PMP) Exam but WILL introduce you to many of the principles outlined in the Project Management Body of Knowledge (PMBOK Guide). This course will introduce to you, or maybe reinforce, some key project management practices that will help your projects be more successful.

Let’s keep you from getting behind the 8 Ball ... 5 Study Areas to Becoming a Better Project Manager:



- Soft Skills for Project Managers – It’s all about People
- Making the Right Assignments (Team Members)
- Identifying Project Stakeholders
- How to Build Highly Effective Teams
- A good Project Structure – The Matrix

So let’s begin by answering the following questions about the 7 Key Study Areas that are important for project success. Your answers to the questions will help assess your project management style and show how sections of this course will help you.

I PROJECT MANAGEMENT BASICS

Q1: Have you ever thought about why projects fail?

Q2: Do you know what makes a “project” a Project?



To know where you want to go you need to understand where to begin so we’ll take a look at the foundations of project management.

In Section I we will introduce you to some common project definitions to help you understand the key characteristics of a project and the project life cycle.

II SOFT SKILLS FOR PROJECT MANAGERS

Q1: Have you ever thought about what personal attributes could make you a better project manager?

Q2: Are you able to get others to work with you towards a common goal of delivering the project?



Soft Skills (People Skills) may be what you are missing. In Section II we will review some People Skills you should work on to be a more effective project manager.

III MAKING THE RIGHT ASSIGNMENTS (Team Members)

Q1: By definition your projects are temporary and the team members that support the project may be as well. Do you take into consideration the individual personalities of your project team and how their interactions can affect the work?

Q2: As the project progress do you monitor and measure individual and collective work performance of the project team as part of project monitoring?



Your project team can make or break the success of your project and it is very important to get the right mix of people with an array of technical and interpersonal skills. Your job as the project manager will be to get the team working together as soon as possible, clearly outline performance expectations, and then monitor and keep the team on track.

In Section III we will discuss how to pick the right team and keep them productive and motivated through the project life cycle.

IV IDENTIFYING PROJECT STAKEHOLDERS – WHO'S WHO ON THE PROJECT

Q1: Do you actually know who ALL of your project stakeholders are?

Q2: While all project stakeholders are important, do you know which ones have REAL influence over the project?



Your project stakeholders will ultimately be the ones to accept your project results so it is important to communicate with them with the right amount of information on a timely basis. But who are your project stakeholders?

In Section IV we will help you look at your project stakeholders through a power and influence perspective. We'll provide a methodical approach to identify your project stakeholders and discuss how to meet their needs while meeting the needs of the overall project.

V HOW TO BUILD HIGHLY EFFECTIVE TEAMS

Q1: Have you ever had the chance to form a project team?

Q2: When you formed the team how did you evaluate if the team members can even relate together?



If you formed the team by gathering a group of available people together you may not realize that the team is not operating at peak efficiency. In fact, your team may have a lot of internal conflict that you are not even aware of.

In Section V we will walk you through a set of simple guidelines to help you build a more effective project team.

VI PROJECT STRUCTURE - THE MATRIX

Q1: Have you ever thought about using a Matrix Organization for your projects?



The Matrix Organization is widely used in large and complex projects, In Section VI we will outline how the Matrix organization works and how it may be worth considering for your projects.

SECTION I

Project Management Basics

In this section you will be introduced to some common project definitions to help you understand the key characteristics of a project and the project life cycle and we'll explore why projects fail and what benefits good Project Management can provide.

1. FAILING BIG or SMALL

The ill effects resulting from bad project management can reach astronomical levels representing a significant waste of time and money and posing a threat to organizations that rely on the success of both small-scale and large-scale projects. Bad project management practices also have non-financial costs. Consider the Columbia Shuttle disaster where the death of seven astronauts has been attributed to organizational problems and a weakened safety culture at NASA. Let's look at a few projects that have failed, big and small:

The Channel Tunnel or "Chunnel"

- 31 mile tunnel running beneath the English Channel connecting the UK and France
- Construction started in 1988, completed in 1994 (20% schedule overrun 6 vs 5 yrs)
- 80% over budget (4.6 billion pounds vs. a 2.6 billion pound forecast)
- It was a unique project but not unprecedented (consider the Seikan Tunnel in Japan)

So what went wrong?

1. Cost overruns resulted from lack of historical precedents to build estimates from
2. The project was plagued by schedule delays from:
 - a. Poor communication between teams (French and British) who were starting from different sides and meeting in the middle
 - b. Change in design specifications (ex. Need for addition of ventilation systems for safety considerations not in the original design)

The Big Dig (Boston's Central Artery/Tunnel Project)

- Largest technically challenging highway project in American History
- Initial cost estimates were \$2.56 billion – final cost was 5X the original estimate
- Reasons reported for cost overruns: cost escalation, poor assessment of unknown subsurface conditions, environmental costs, expanded scope

- The project was led by Bechtel/Parsons Brinckerhoff, one of the largest and experienced teams in infrastructure programs
- Project start 1991; scheduled completion 1998; ACTUAL completion December 2007

So what went wrong?

A collaborative, integrated project management team that should have been involving all parties in decision making was not in place until July 1998 when design of the project was 99% complete and construction was 45.9% complete.

How about “Your” Project

- It wasn't smallest or largest in your history
- The construction schedule overrun was only a month on a 9 month project
- We were only slightly over budget, say 15% on a \$500,000 project
- You thought you assembled a pretty good, technically sound project team

So what went wrong?

You may not really be sure! But looking at the 2 big failures above ... have you ever heard this:

Lack of historical estimates

Project was unique, 1 of a kind,
never been done before...

Poor Communication

Design changes


Unknown conditions

Lack of sound experience

Bad Leadership

SCOPE creep

2. WHY DO PROJECTS REALLY FAIL?

Let's first define "failure"? We typically think of failure as not meeting the required delivered cost or failing to meet desired quality or not meeting the required schedule.  **Q1**

But in fact projects fail in obvious ways, in subtle ways, and sometimes in ways that are pure based on perceptions. Have you ever felt like:



This is the stakeholders vision of the project



This is how the project team sees the project being completed



This is what actually gets delivered

The **OBVIOUS** ways a project may fail include:

Fail

- The project comes in over budget – or the project may have to be halted prior to completion due to insufficient funding

Fail

- The project takes longer than planned – or the project runs out of time before the desired goals are achieved

Fail

- The project does not meet the desired quality requirements - or of lower value than expected

Some more **SUBTLE** ways a project may fail include:

Fail

- Project objectives may have not been clearly defined for the project team

Fail

- The desired project outcome was not clearly communicated

Fail

- The final end user of the project was not consulted about their needs

Fail

- The project team may have lacked specific training / expertise in the project area

But more often than not a project is considered a failure when the results are not delivered “in line with expectations”. And unfortunately “in line with expectations” is not always that clear. For example, say the key project stakeholders agree that a project must exceed the initial budget to hit a “must meet” project schedule. In this case the project could still be considered a success. Or say a project delivers everything in the original design specifications but fails to meet a key requirement of one of the primary stakeholders – this could be considered a failure. So it is important to monitor the stakeholders and ensure the project is perceived “in line with expectations”.

Perception is Reality

Perceptions can be very closely aligned with stakeholder expectations. For example, if a stakeholder perceives a project team as being unresponsive and lacking direction, they will tend to expect bad service. And any instances of good service will be perceived as an exception. And since we all have a tendency to remember the bad experiences much more strongly than the good experiences this project team will more than likely meet failure on their project.

So to overcome negative feelings, here are 3 things to consider, if as the project manager, you want to change stakeholder perceptions:

1. Try to improve your rapport with your stakeholders and try open more effective channels of communication (outside of what you are doing now – change it up!)
2. Improve your “street cred” or credibility with your stakeholders by providing more accurate and timely information that precisely meets their needs (Why not ask them what they think?)
3. As much as possible, try to differentiate and distance your current project from previous negative experiences (Show them your different and can expect different)



Unfortunately project failure is not always about the FACTS or what was ACTUALLY delivered. Remember Perception is Reality! Watch your stakeholders and keep them close as your project progresses.

3. MAKE SURE YOU HAVE A PROJECT - KEY CHARACTERISTICS OF PROJECTS

You cannot learn about how to manage a project unless you're sure you actually have a project. A project can be described as a sequence of tasks that are planned from beginning to end with a specific defined outcome. Common Project attributes include:

- A project must have a beginning
- A project must have a budget and requires a commitment of resources
- A project must have an ending (usually when all of the project goals have been met and all of the work of the project has been accomplished)
- A project has some type of constraints that limit and define the required progression
- A project usually includes multi-disciplined project teams bringing unique individual skills to the project when needed (the right people at the right time)
- A project is temporary (not necessarily short in duration and yet not an on-going effort that is repetitive – this is an operational function)
- A project is unique (typically something that has never been done before). For example, a contractor may construct many houses but each one is unique in its layout, location, etc and should be considered a unique project.
- A project always has one or more “stakeholders” that define the needs and expectations that must be met by completion of the project
- A project always involves a certain degree of uncertainty

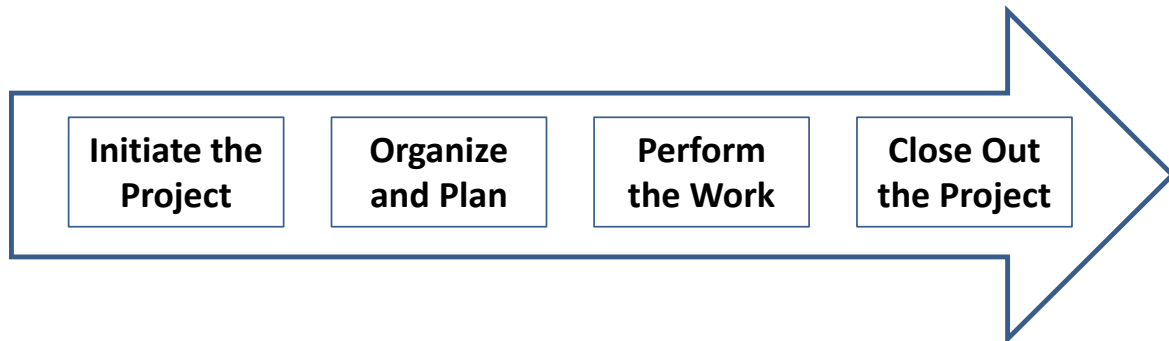


Projects vs Operations - Make sure you have a Project and not an Operation. If your project definition starts to look like a series of ongoing activities that are required, repetitive, and will produce the same product or service your work will continue and never end – you have an Operation. Employment of good Project Management techniques will not be as effective in this case.

4. THE PROJECT LIFE CYCLE



OK, now that you know you have a project you need to understand that successful projects, large or small, all need to pass through the same four stages. Together these distinct phases are combined to form the Project Life Cycle.



STAGE 1: Initiation (Starting the Project)

In this stage the project manager defines what the project is and what stakeholders hope to achieve by completing the project. This stage also involves framing the general approach to performing the project and the agreement to prepare a detailed project plan. Your job is to develop the project framework.

Output from this stage may include (1) documentation of rough estimates of time and resources, (2) development of a Project Charter, and (3) preliminary list of project stakeholders. (See below)

"I think what coaching is all about, is taking players and analyzing their ability, put them in a position where they can excel within the framework of the team winning. And I hope that I've done that in my 33 years as a head coach." Don Shula, Head Coach of the Miami Dolphins, (1970 to 1995)

STAGE 2: Organization (Planning the Project)

In this stage, specific work plans need to be developed including the desired results from the project. Determination of the work to do, the required time, costs, and needed resources have to be made. In addition, key project risks and project assumptions should be identified and documented.

Output from Stage 2 may include a project plan which documents the intended project results and the supporting processes needed to achieve them.

STAGE 3: Perform the Work of the Project

In Stage 3, the project team and support systems are put into action to perform the planned work. Frequent Monitoring and Controlling functions should be in place to ensure the project is adhering to the project plan. The project manager is in charge of updating the project plans to reflect actual progress.

Output from this stage may include project results, project progress reports, and other project status communications.

STAGE 4: Closing Out the Project

In Stage 4, the results of the project are assessed against the project plan. Stakeholder approvals are required and project team members begin the process of transitioning off of the project. Financial accounts are closed and post-project evaluations should be complete.

Outputs from Stage 4 may include final stakeholder approved documentation and evaluation of applying “lessons learned” to potential similar project efforts in the future.



Managing stakeholder expectations is very important in Phase 1 (Project Initiation). Since the stakeholders are often managers or directors of an organization they tend to have more influence. Make certain you communicate with these stakeholders often in order to resolve issues, implement requested changes ,and manage concerns before these become potential problems in



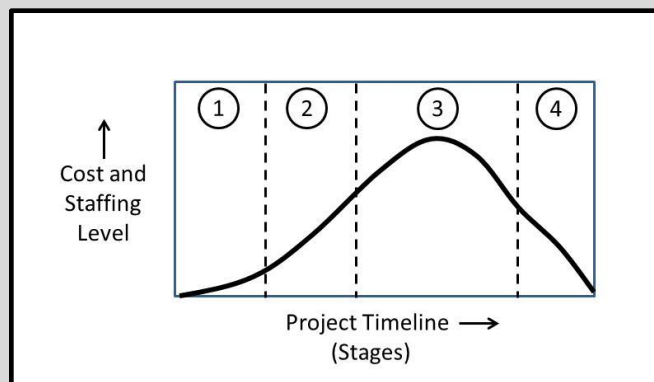
Resist the temptation to fast-track from Phase 1 to Phase 2 as the highest risk is in these earlier phases when the available information is at its lowest. Also costly re-work and error corrections can be avoided in later phases if the project assumptions are found to be incorrect later.

COMMON ELEMENTS TO EACH STAGE OF THE PROJECT LIFECYCLE

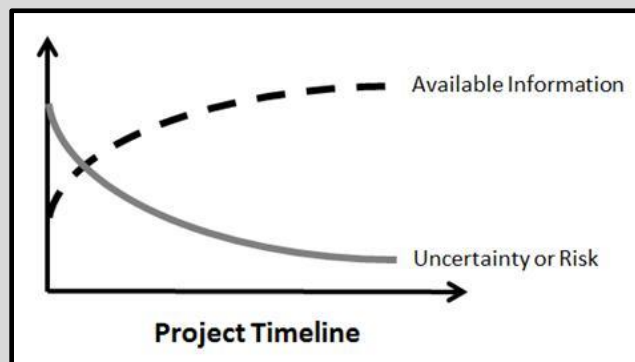
- In order to improve management and control of the project, the project phases are designed to aligned in a logical sequence and segregated
- The conclusion of one phase typically precedes moving to the next phase. At this point before moving to the next phase a review of both deliverables and project performance at the conclusion of each project phase will (1) determine if the project should continue on to the next phase and (2) allow for detection and correction of errors. This review is often called a phase exit, kill point, or stage gate.

Note: Sometimes a subsequent phase is started prior to approval of the previous phase deliverables -- when the risks are deemed acceptable. The practice of overlapping phases is often called fast tracking.

- Cost and staffing levels are low at the start of the project and higher toward the end and then drop rapidly as the project draws to a conclusion



- Risk and uncertainty are highest at the start of the project and thus the probability of successfully completing the project is lowest. (See Figure 2)






- Stakeholders have the largest influence over the project scope and final costs at the beginning of the project and gets progressively lower as the project continues. (Because the cost of changes and error correction increases as the project continues through each progressive stage)

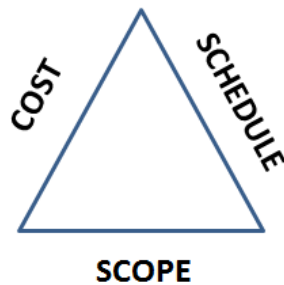
5. PROJECT MANAGEMENT DEFINED**Project Management definition:****project, job**

The process of planning, organizing, staffing, directing and controlling the production of a system

Substitute “system” with “project” and let’s expand our definition to say –

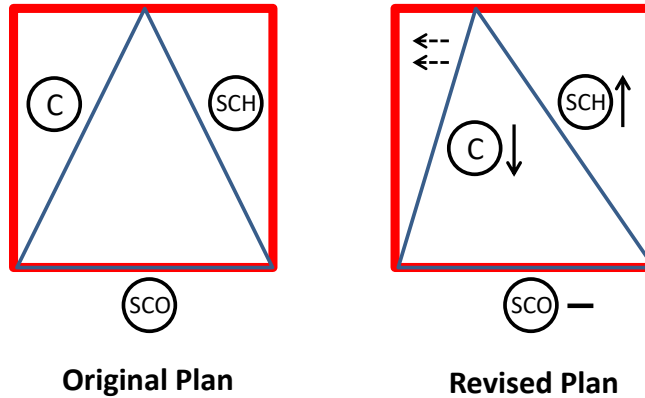
PROJECT MANAGEMENT:

-  Is the process of planning and organizing the components of a project into a desirable timeline **[SCHEDULE]**
-  Requires the use of sets of tools and techniques to effectively manage a project against a pre-defined resource budget **[BUDGET]**
-  Continually assesses the progress of the project against the goals and expectations of the stakeholders of the project **[SCOPE]**

**The “Triple” Constraint**

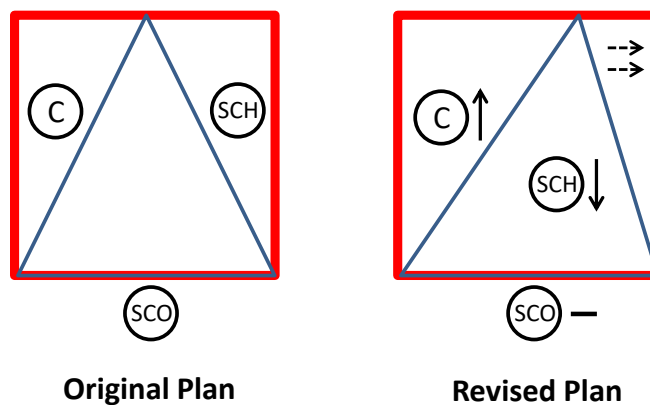
So, Project Management becomes the effective process of managing the triple constraint of schedule (time), cost (resources) and quality (scope) while meeting the expectations of the project stakeholders. These three elements work in tandem which each other whereas if one element is restricted or extended then the other elements will need to be extended/increased or restricted/reduced in some way. Draw a triangle for yourself and stretch any one side and see how the other sides are affected. Note where: C = Cost, SCO = Project Scope, SCH = Project Schedule, Outer Box is the Stakeholder Expectation Boundary. Let’s look at some examples of managing within the “Triple” Constraint:

Example 1:
Desire to Reduce Cost – No Change in Scope



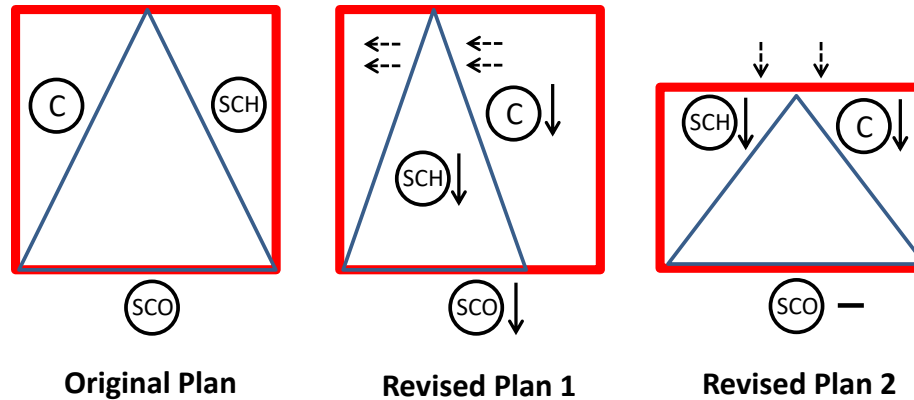
A desired reduction in project costs without a reduction in the project scope could possibly be achieved by extending the project schedule and optimizing the allocation of resources to the project (i.e. maybe less overtime or the additional time allowance could allow for lower cost outsourcing of some deliverables of the project)

Example 2:
Desire to Shorten Project Schedule – No Change in Scope



A desired reduction in the project schedule without a reduction in the project scope could possibly be achieved by increasing the project budget to allow for additional resources to be used on the project (i.e. more overtime or adding short term workers to complete tasks quicker)

**Example 3:
Desire to Shorten Project and Costs – The Dream**



As in most projects there is always a desire to reduce the project schedule and the project costs. 2 Proposed options could be available to achieve this goal, which would need the explicit approval of the stakeholders: (1) Reduce the project scope or (2) Reduce the quality of the deliverables while maintaining the project scope (if possible)



In successful Project Management the more common challenge will be the role of the Project Manager to educate your client or stakeholders that if a project is to be completed at a certain level of quality, then a certain amount of time and money need also to be invested in the project. Likewise, a project that has strict time constraints will require an increased amount of assigned resources or a reduction on quality or scope to meet the schedule.

6. BENEFITS OF PROJECT MANAGEMENT

You, as a Project Manager ultimately are expected to produce RESULTS! And not just any results, your results have to meet the needs of your client, be on-time, and be on-budget. But, remember, Project Management requires a commitment of time and resources. If challenged, here's 8 Reasons your client needs Project Management:



1. You've Got to Control Scope Creep and Manage Change

Change in a project is inevitable and can come from your project team, your customer, your suppliers and vendors, or even other stakeholders. The changes, however uniquely small, could accumulate to create "scope creep" that could overrun the budget or the schedule.



2. You've Got to Deliver the Project On Time and On Budget

Once the project justification is in place (the expected costs are in place) it's up to the Project Manager to maintain on-time and on-budget performance otherwise the project justification could be invalidated.



3. You've Got to Keep the Team Focused

The natural human tendency of work groups is to easily drift off topic and spend too much time on the wrong tasks. As the Project Manager you have to keep the team focused and keep your team from being distracted from outside influences



4. You've Got to Define and Defend the Critical Path

Again since a project is a series of connected activities with each having its own constraints, if someone isn't responsible to identify the optimal path of action how can the project team find or even stay on track?



5. You've Got to Keep an Eye on the Costs

As we saw above the project has a defined budget – who is going to keep an eye on the budget progress?



6. You've Got to be the Messenger

Who is going to communicate the good, the bad, and the ugly? The Project Manager is the communicator responsible for relaying information to the project stakeholders about project progress, changes, stumbling blocks, or even successes.



7. You've Got to Expect the Unexpected

Every project will run into an unforeseen issue but who is going to plan and execute the alternate course of action? - The Project Manager



8. You've Got to END the Project

Every project has to START and every project has to END. Before moving on to the next project the Project Manager has to provide the proper close-out documentation, turnover and acceptance documents, and the historical archive of "lessons learned" for the next project.

As an engineer acting as a project manager it's obvious you need must basic skills and knowledge in project management tenets, be able to perform using this knowledge and have personal skills to deal with people involved with the project. But it is also important to recognize that there are "Soft skills" that are needed to be really effective in your role. But what do we mean by "Soft Skills" and how they should be measured? First consider, What are Soft Skills:



Soft skills are the personal attributes you need to succeed in the workplace. Often related to how you work with others, Soft Skills are basically people skills.

Soft Skills cover a wide swath of skills including communications, interpersonal skills and how an individual builds and maintains relationships with others. As a project manager, getting others to work with you towards a common goal is paramount to delivering a project.

STEP 1: ESSENTIAL SOFT SKILLS FOR MANAGERS:

- **Communication and Consultation**
- **Active Listening**
- **Conflict and Crisis Management**
- **Flexibility and Creativity**
- **Demonstrated Leadership**
- **Encourage Learning and Development**
- **Practice Professionalism and Ethics**
- **Trustworthiness**
- **Practice Self Control**
- **Better Decision Making**



Communication / Consultation

Open and Honest Communication

While good communication is seemingly easy to achieve, in reality it can create lot of issues on the project. Remember, communication is a two way street so open and honest communication from top-down will ensure the same bottom-up. To be effective, the project manager should communicate decisions and information transparently with the team this will in turn let team members feel comfortable about

opening up with the manager about their concerns, issues and even provide constructive suggestions. Open communication practice builds mutual trust amongst team members.

You need an ability to interact with people about ideas, thoughts, facts, motions, challenges, successes - directly alongside hard facts (i.e. project progress). An effective project manager will:

- (1) Have an ability to convey complex ideas easily
- (2) clearly articulate what must be accomplished
- (3) keep the team moving toward a common goal
- (4) foster an environment that allows team members to communicate openly and honestly
- (5) communicate with people at all levels

Request Feedback

By being open and direct with communication, the effective project manager will clearly call out goals, responsibilities, performance, expectations and requests for feedback. Be sure to support individual and team achievements by creating explicit guidelines for accomplishing results and for the career advancement of team members.

Constant Communication

While cutting back on project communication can provide a short-term advantage of saving time and time saving, it will create long-term problems. Constant, effective communication among all project stakeholders ranks high among the factors leading to the success of a project. It is a key prerequisite of getting the right things done in the right way. As knowledge is power, sharing knowledge empowering every project stakeholder.



ACTION:

1. Make a communication plan - written strategy for getting the right information to the right project stakeholders at the right time
2. Make the information communicated timely – deliver the targeted information to targeted users on a timely basis. It's important to decide how often to contact each stakeholder and with what information
3. determine the best medium to use to for communication - team meetings, memos, voice mail, and e-mail



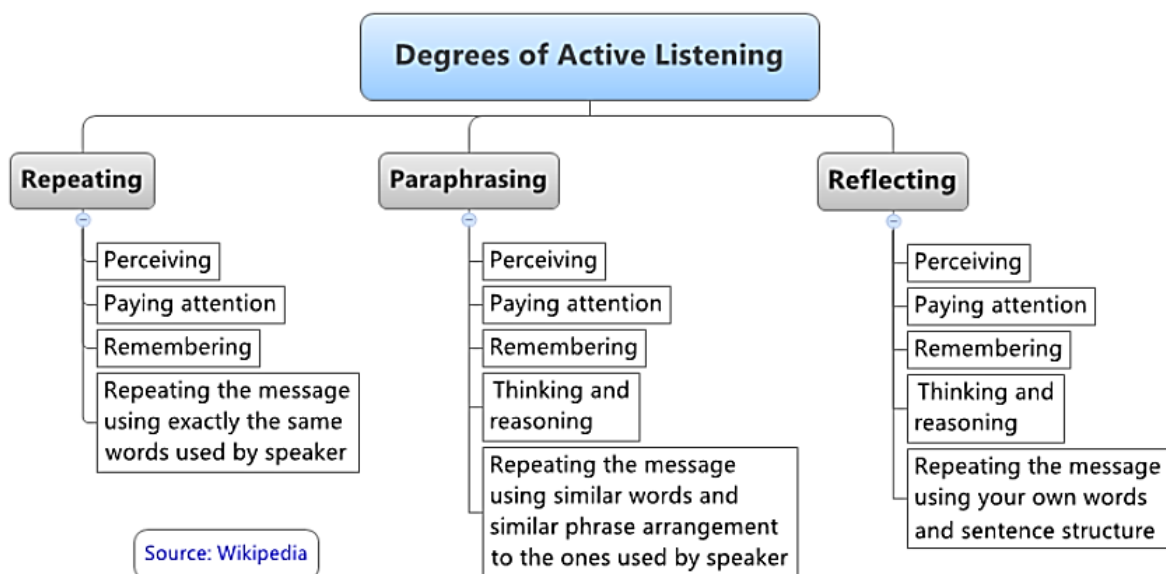
Active Listening



Another way to enhance the communication within the project team is to be an active listener. Active listening is a communication technique where a listener gives constant feedback to the speaker, by re-stating what they have understood. In this way both speaker and listener make sure that the message has been communicated as intended.

So in order to practice active listening you will need to overcome the urge to 'wait to speak' and instead focus on understanding what is being spoken. In turn you can relay back any communicated information by phrasing what you heard in your own words.

Various degrees of active listening levels are listed in the figure below



Conflict and Crisis Management



Conflicts are part of any system, more so when people are involved. Essential skills include listening and responding to the needs and views of all team members to anticipate any potential areas of conflict. The goal is to diffuse situations before conflict arises and to keep an orderly and healthy project environment.

How will you resolve conflict? No one likes a leader who is negative - they bring others down. The team wants leaders with enthusiasm - a bounce in your, a can-do attitude. Who would you want to follow, a person with a can-do attitude OR one who gives you 10 reasons why something can't be done. Leadership emerges as someone expresses such confident commitment to a project that others want to share his or her optimistic expectations. Enthusiasm is contagious and effective leaders know it.

**ACTION:****Effective Resolution Steps:**

1. Verify if members indeed are in conflict. Ask and Listen.

Before jumping in, understand that a project team may not be in destructive conflict at all. In fact some of the most robust project groups might appear to be in conflict when in fact the team members actually feel comfortable to share their views. Conflict can be considered destructive if there are ongoing disagreements, name calling and the team members are getting upset.

So to start, describe what behaviors you are seeing that might indicate destructive conflict but don't try to "diagnose" the causes of those behaviors. Acknowledge that conflict is natural in healthy groups, but explain why you suspect that conflict has become destructive.

2. If there is destructive conflict, the following approaches help to resolve the conflict
 - a. Take a 5-minute break
 - b. Ask one or two other members (a subgroup) to step aside with you
 - c. Ask them to suggest an approach to address the conflict
3. Use approaches selected by the subgroup with the entire group

Explain that the approaches were selected by several of you, not by just one person. Then ask that members set aside 10-15 minutes on the agenda to try them out. The more the members are in destructive conflict, the more likely they will be willing to try out the approaches.

**Flexibility and Creativity**

Try thinking in original and imaginative ways to widen the scope of problem solving. Flexibility and Creativity is not a "hard" skill – there are no equations, methodologies, formulas, or process diagrams. Rather Flexibility and Creativity involves attitude, behavior, enthusiasm, and ideation.

Some ways to promote flexibility and creativity include:

1. Encourage project teams to find the best solution and outcome – but don't just follow generic delivery methods or solutions
2. Adapt the project to use different components, templates, and tools

Be careful not to:

1. Be so creative that you no longer perform the role of the project manager
2. Use creativity as an excuse for not performing quality control or business analysis
3. Make every document look 'creative' (looks different) – don't recreate the wheel by starting with a blank piece of paper every time you create a document



ACTION:

1. Improve Communication – as a huge part of project management, creativity can enhance your communication and improve its effectiveness. Effective use of colors, charts, and pictures to communicate concepts visually is very helpful
2. Upgrade your meetings – over use of boring meetings can be counterproductive. Try varying meeting locations. Hold a meeting outside, have a walking meeting. Go 'off-site.' Choose creative locations and conditions.
3. Motivate the team with Rewards - keep a team motivated by providing individual recognition or celebrating small team successes. Something that is slightly different from the 'usual' is usually more appreciated by team members
4. Upgrade your Tools - Are you still using the same basic project management tools that you were using 5 or 10 years ago? If yes, be creative and look for a change.



Demonstrated Leadership



“Effective leadership is not about making speeches or being liked; leadership is defined by results not attributes.”

– Peter Drucker

Inspire and Empower

Leadership is essential to good project management where you have an ability to get things done through others. By properly conveying the vision of the project and the value that team members provide you will inspire others to do the work by making people want to do the work.

Leadership is also about showing people how they can achieve their own PERSONAL objectives by aligning themselves to the PROJECT's objectives. Create a win-win! For example, an engineer has a career goal to become a special inspector than by assigning the engineer to projects in a design phase of specific projects will give him / her the ability to acquire required knowledge while contributing to the project success.

Share the Vision

You need to understand the vision and direction of the project and align the team to work towards this vision. Some examples include:

1. Delegating
2. Coaching and motivating
3. Leading by example

An effective project leader is often described as demonstrating leadership by having a vision of where to go and the ability to articulate it. Collectively called a visionary, the demonstrated leader thrives on change and has an ability to draw new boundaries. How will you know you are demonstrating leadership?

1. The team members feel they have a real stake in the project
2. Team members feel empowered to experience the leader's vision on their own

Delegate

You also demonstrate your trust in others through your actions -- do you delegate?

1. How much do you check and control other's work?
2. How much do you delegate and how much do you allow other people to participate?
3. Are you a micro-manager that ends up doing all of the work themselves?



ACTION:

1. Look for challenges - Challenges lead to new ideas and improvements in the current processes
2. Create a vision - think of a future state of the organization when its strategic goals are achieved. Take a long term approach in achieving the vision.
3. Motivate and inspire team members simply in the way they work: setting goals, making meaningful contributions, recognizing their efforts, and encourage the team to deliver the best work that they can
4. Take action that can impact the entire organization and also people outside the organization – your influence should extend beyond the boundaries of the organization



Encourage Learning and Development:

Continually improve both your own skills and those of your team:

1. Assess your and your team's skills and capabilities
2. encouraging participation in learning activities
3. Evaluating how the learning can be applied on the project

If you want to enlist others towards the goal – other's have to know that the project manager knows what he or she is doing – you have to be competent. Note: Leadership competence does not necessarily refer to technical abilities but an ability to challenge, inspire, enable, model and encourage learning and development of all of the team members

When people know that their work is making a difference – to the customer, end users, company, as well as themselves – they stay motivated. People have various personal and professional needs and goals, and they need to be satisfied on that front. For some people it may be about financial compensation, for some it is sense of accomplishment by doing challenging work, for some it could be hierarchical growth and for others it could be getting recognition of their hard work. Knowing what motivates each of your team members and helping them get those things will keep the team motivated.



ACTION:

1. Share personal productivity tips and techniques with your team - Share simple ideas
2. Set up internal work and training plans for individual team members



Professionalism and ethics:



1. You demonstrate professionalism through knowledge, skills and your behavior
2. You demonstrate your moral principles in both your personal actions and within the project environments

Your actions, not your words, set the mode of operation for the project team. Good leadership demands commitment to, and demonstration of, ethical practices. Creating standards for ethical behavior for oneself and living by these standards, as well as rewarding those who exemplify these practices, are responsibilities of project leaders.

Leadership motivated by self-interest will not serve the benefit of the team. Leadership based on integrity represents a set of values others share and earns trust along the way.



ACTION:

1. Be responsible — take ownership of decisions including their consequences. This includes knowing and meeting all legal requirements, reporting unethical or illegal conduct to appropriate management, fulfilling commitments and protecting proprietary and confidential information.
2. Be respectful of yourself, listen to others and protect resources entrusted to us.
3. Be fair and transparent in decisions including disclosing conflicts of interest to appropriate stakeholders.
4. Be honest in communications and conduct.



Trustworthiness



Bottom line: Do what you say you're going to do!

Build Trust

Project management is largely driven by decisions and every day a project manager needs to make decisions, some are small while others are prominent. And just like business leaders, project managers also build trust with their decisions and need to trust their teams at work.

Then what makes “trust” so important? Trust facilitates better communication. For example, when you trust someone at work, the likelihood of having an easy, open and honest communication is likely better. You engage more often and can freely discuss and even debate new ideas and innovations with the trust that in return you will receive an honest feedback. It also facilitates quicker decision making as there are less hidden agendas within the team. And moreover, when you trust a person, chances are you will delegate more responsibility to him/her.

Lack of Trust – What Happens

But what if trust is absent between the project manager and team members?

1. First, communication takes more time than usual and all parties will tend to measure everything more carefully before discussing any idea or issue. In fact team members are less likely to engage and less likely to delegate.

2. Second, while everyone can still work together, even without trust, there are less chances of collaborating efficiently. In fact, project teams are more likely to follow up more, micromanagement more and eventually result in ineffective project work.
3. Third, Team members may feel unmotivated and fail to communicate ideas openly when they cannot trust their project manager.



ACTION

1. Emphasize that Accountability Means Responsibility, It Doesn't Mean Blame
2. Make sure each and every team member feels needed and make sure each knows how important he or she is to the process
3. Results-orientated goals are more helpful than lists of routine tasks - Let your team members know what goals need to be achieved, and let them set their own daily routines and tasks



Practice Self Control:

Self-control and self-management ensure day to day stresses are addressed and a therefore a work / life balance is maintained. Ultimately, the only way to control a project is for every member of the project team to be in control of his or her own work. A project manager can achieve control at the macro level only if it is achieved at the micro level. However, this does not mean that you should practice micro-managing! It actually means that you should set up conditions under which every team member can achieve control of his or her own efforts.



ACTION

1. Clarify what the objective is for every team member – be careful not to assign tasks rather state the objective, explain what the purpose of the objective is and then allow the individual to pursue the objective in his or her own way
2. Provide direct feedback to each team member – do not give direction in a roundabout way – do not let your emotions get the best of you
3. Define clearly for each individual his authority to take action when necessary – if there is a deviation from the plan, give the team member the authority to take some corrective action. If the team member has to ask the project manager what to do every time a deviation occurs, the project manager is too controlling.



Decision Making:



Decision making is about how does a project manager goes about handling issues on the project. Here are a few basic techniques in decision-making:

1. **Command** – this type of decision making is authoritative. Project manager’s decision is final, and team is expected to follow it.
2. **Consultation** – is when you consult your team members and stakeholders and then take the most rational decision in the best interest of the project.
3. **Consensus** – means that a decision that appeals to the majority of the team is taken. This may not be the best way to make – means that a decision that appeals to the majority of the team is taken. This may not be the best way to make decision because decision of majority may not necessarily be in the best interest of the project.
4. **Coin-flip (random decision)** – this is the least preferred one and best avoided. Decisions made using this technique do not generally gain respect of team members, since there is



ACTION

1. Define a problem in a clear and concise way
2. Brainstorm multiple solutions and ensure that decision is not arrived in haste
3. Define evaluation criteria, explore pros and cons of each of the alternative solutions, choose the best solution
4. Figure out who is involved in implementing the solution and who gets affected -- involve them to gain acceptance of this solution
5. After implementing the solution, analyze, evaluate and list lessons learned
6. Evaluate to what extent project objective was achieved by this solution

STEP 2: IDENTIFY COMMON NEGATIVE BEHAVIORS



These are the most common negative behaviors that inhibit your ability to lead the project effectively:

Is there a Communication imbalance?

1. Don’t treat knowledge & information like power – sharing it only with those you wish to curry favor with, and then leaving everyone else in the dark

2. Don't treat information like you work for the CIA – sharing it on a need to know basis (where you feel most people DON'T need to know)
3. Don't treat information like Goldilocks - Too much or Too little – understand the needs of your team members and stakeholders, some require frequent real-time information pushed to them, others prefer less periodic higher level status updates

Are you Neglecting some stakeholders?

1. Don't get tunnel vision by focusing purely on the direct customer or sponsor
2. Focus on a negative stakeholder can be a common source of risk to a project – remember there are multiple stakeholders on a project
3. The best response is through regular stakeholder analysis - Meet individually with your stakeholder representatives early on and reinforce these relationships throughout the lifecycle of your project

Are You Ignoring conflict?

1. You have to recognize that conflict is a natural occurrence on projects
2. Don't ignore the need to manage interpersonal conflicts
3. Don't be tempted to ignore interpersonal conflicts in the hopes that the situation will resolve itself – it usually won't

Do you have a blind focus on technicals?

1. Don't focus solely on the scope, schedule & cost constraints are important (the triple constraint)
2. Don't ignore the fact that a project has to deliver value to the business – avoid the situation where “the operation was a success, but the patient died”
3. Continually as the team questions such as “Is this deliverable necessary to the end result”, “Are we gold-plating” or “Is this project still of value to the organization”?

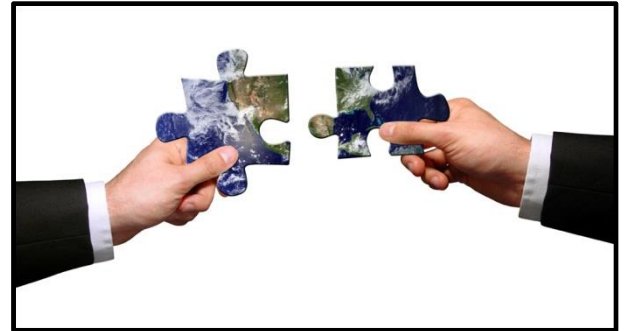
Do you check you assumptions?

1. To reduce uncertainty found in any project – a project manager has to make assumptions – do you log your assumptions and back check them?
2. Don't keep the assumptions to yourself - share them with the overall project team - attempt to proactively validate them
3. Be sure to enter the assumptions as an input into the risk identification process

SECTION III

MAKING THE RIGHT ASSIGNMENTS

If you are the Project Manager, it's safe to assume you will have a project team – be it large or small. And with limited resources and time, Project Managers always have more work than time. So careful planning of how to utilize your available personnel will enable you to:



- Assign the most qualified, available people to project tasks
- Establish clear responsibilities and expectations
- Develop realistic schedules and make timely assignments
- Better monitor project expenditures

So in this section we are going to walk through some steps to help you make the RIGHT assignments on your project.

STEP 1:

MAKING SENSE OF THE ASSIGNMENT (WHO do I need?)

As we all know the coach always wants the best veteran players to ensure the team's success but this team is rare. So how do I get the right people assigned to the right task? Consider these steps:

1. **Determine the required skills / knowledge for each project activity**
 - What are the main skills the individual needs to be able to do?
 - Are there new skills that will be required in the future?
 - Are there specific standards or requirements that have to be met?

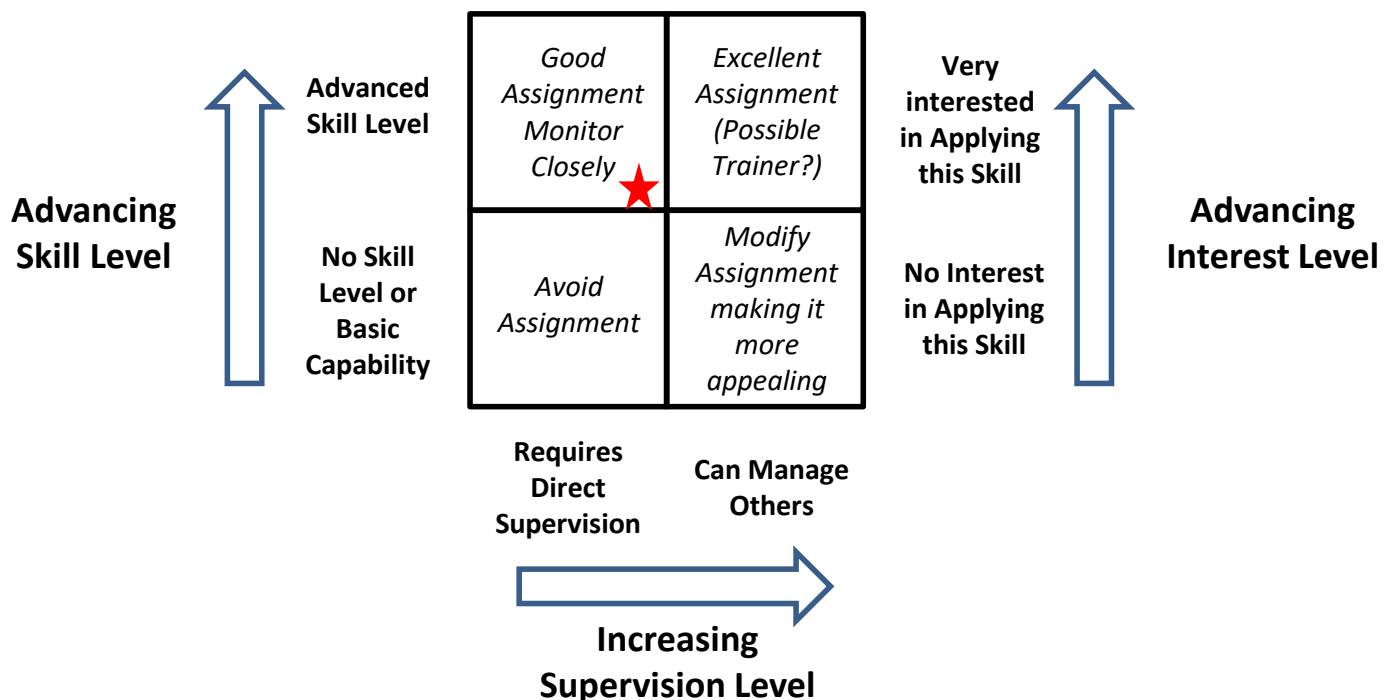
2. **Confirm the person assigned actually possess the required skills / knowledge**
 - Can the individual actually complete the task?
 - If yes, can the individual complete the task to the required standard in the required time?
3. **Affirm that the person assigned is genuinely interested in their assignment**
4. **Assess the working relationship within the assignment (Is managing others involved?)**

A simple yet effective tool that will help identify gaps or vulnerabilities in your project team and their project assignments is the Skills Matrix. The Skills Matrix, in a tabular format, lists a project team member's individual skills, knowledge, and interests. Next check the "fit" of the individual against the requirements of the assignment:



Here's how it works – Example: a job requires a specialized skill in computers. Bob does have good programming skills but not in this new language. He has showed a strong interest in learning. Bob has been dependable in the past and you think he can get the job done.

Place Bob on the scale – it looks like Bob is a decent fit but you need to keep an eye on the assignment and monitor Bob's performance.





Avoid assigning junior team members to tasks associated with the critical path. A good training opportunity for future projects exists if you can use team members that have an advanced skill level and an interest in applying their skills as mentors to junior team members.

STEP 2: ESTIMATING TIME COMMITMENTS FOR PROJECT TASKS (HOW MUCH do I need them?)

Assigning the most qualified, interested team member to a project assignment does not guarantee success if the person does not have enough TIME to perform the work. You will need to accurately estimate the amount of actual time is required to complete an activity. The estimate needs to be in the form man-hours, man-days, man-weeks etc.

Also note, being given a project assignment does not necessarily mean that the team member can work at 100% peak productivity 40 hours per week, 52 weeks per year. In fact other personal and organizational activities will always reduce the amount of work output so factors such as productivity, efficiency, and availability will need to be considered.

A. Estimating the required work effort for each activity

Action	Considerations
Provide a detailed description of the work	Be sure to include both work directly and indirectly related to the task: <ul style="list-style-type: none"> • Direct work: meeting with clients, writing reports, planning • Indirect work: preparing progress reports
Review history	Consider any previous projects that have similar work activities and review the amount of work effort actually spent. Be sure to assess: <ul style="list-style-type: none"> • The people who worked on the previous project had similar individual skills, knowledge, and interests (Step 1 above) • The time frame of the previous project is similar to your current project expectations • The previous technology and facilities available are similar to current offerings

Use the Assigned Person to Participate in the estimate	Allowing team members to contribute up-front in man-hour estimates will: <ul style="list-style-type: none"> • Improve their understanding of the activity itself • Enhance the accuracy of the estimate • Increase the commitment that work will be completed as planned
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B. Factoring Productivity, Efficiency and Availability



Factors	Considerations	Recommendation
<p>Productivity:</p> <p>How much a person produces per unit time (a personal measure)</p>	<ul style="list-style-type: none"> • Not 100% • With more knowledge and skills with a particular task productivity is higher • Prior experience improves productivity • Better available equipment and resources improves productivity (i.e. computers) 	<p>Historical review of similar project timesheets can provide a good assessment of productivity</p>
<p>Efficiency:</p> <p>Percentage of time spent on project work vs non-project work (i.e. personal time, general meetings, etc)</p>	<ul style="list-style-type: none"> • Not 100% • Team members will spend some amount of time attending common organizational meetings • Team members will spend some amount of time on personal business, taking breaks, or talking about non-project work 	<p>Try to have non-project specific work reported on timesheets separately. This breakdown would provide a historical basis for estimating efficiency on future projects</p>
<p>Availability:</p> <p>Percentage of time spent on the job vs time off</p>	<ul style="list-style-type: none"> • Could be up to 100% for short durations • Amount of time per person is unique and is determined through organizational policy (i.e. employee vacation time, sick time, holidays etc) 	<p>Ask the individual what type of availability they have for the projected time frame – they should know what type of vacation plans they have!</p>



When deciding how to many hours to budget for a project task recognize it will not be 100%. If percentages are available take the product of each to calculate the overall % manhour productivity. (i.e. 75% efficiency and 80% availability = $.75 * .80 = 60\%$ productivity)



Be sure to consider project members vacation plans and sick time in longer duration assignments (> 2 months) as you plan the project personnel budget. While not treated as a project expense, sick time off or vacation time will reduce the amount of productive time available to the project.

STEP 3:

MAKING TIMELY ASSIGNMENTS

(WHEN do I need them?)



In the ideal project world, the project manager would have team members assigned only to one project at a time or if assigned to one project, the team members would work on only one project task at a time. But any experienced project manager knows this is hardly the case. So in order to ensure your team can meet multiple project commitments the project manager must decide WHEN to allocate work efforts on each project activity.

Consider the use of a bar graph called a Resource Histogram (or Person-Loading Chart) to depict the level of work effort required for each project activity and project member. The goal in using the Resource Histogram is to eliminate over commitment of personnel resources.

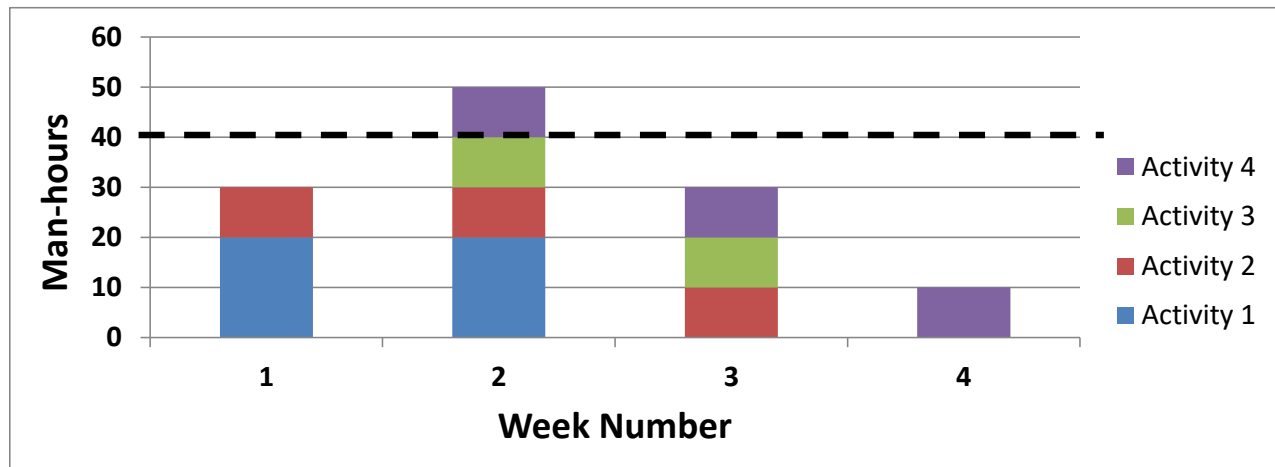
If an overload situation is unacceptable, there are 3 potential solutions to reduce the man-hour commitment of a project member.

- Re-allocate the work effort time **UNEVENLY** over 1 or more activities
- Use slack time in the schedule to modify start of an activity
- Re-assign work to another assigned team member

Example: Team Member working multiple activities on a single project

Bill has been assigned to 3 tasks on the project and his time allocated for each activity has been estimated using the techniques in Step 1 and 2 above. The project output requires that Bill cannot work on each activity on its own. From the start week, Man-hours are evenly split over the duration of each activity.

Activity No.	Duration (Weeks)	Work Effort (Man-hours)	Start Week	Man-hours Week 1/2/3/4
1	2	40	1	20 / 20 / 0 / 0
2	3	30	1	10 / 10 / 10 / 0
3	2	20	2	0 / 10 / 10 / 0
4	3	30	2	0 / 10 / 10 / 10

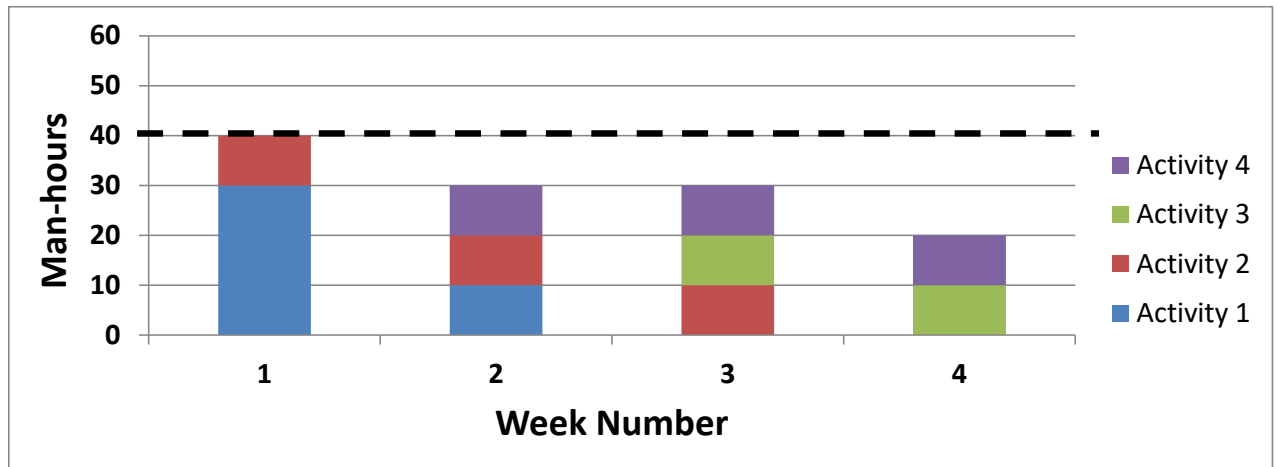


A quick review of Bill's Resource Histogram shows that for a standard 40 hour work week, Bill is overloaded in week 2. As the project manager, if you accept the overtime charges in week 2 the work plan as it stands is OK. If not, consider the following solutions.

Solution 1: UNEVEN Re-allocation of Work Effort

However, as the project manager you decide that re-allocate Bill's work on activities 1 and 3 to reduce the overtime situation. Bill's revised work effort is in the table below.

Activity No.	Duration (Weeks)	Work Effort (Man-hours)	Start Week	Man-hours Week 1/2/3/4
1	2	40	1	30 / 10 / 0 / 0
2	3	30	1	10 / 10 / 10 / 0
3	2	20	2	0 / 10 / 10 / 0
4	3	30	2	0 / 10 / 10 / 10



The overloaded situation is alleviated through re-allocation of Bill's time. Notice:

- None of the activity start dates were changed or effected
- None of the activity end dates were changed or effected
- The duration of each task was held constant
- Only the hours worked in each week were changed (see highlighted yellow area in work effort table)

Solution 2: MODIFY Activity Start Times (Take Advantage of Schedule Slack)

In this case, as the project manager you notice that activity 3 has slack time in the schedule and has a late start of week 3. You decide to start Activity 3 later by 1 week – see the revised work effort in the table below.

Activity No.	Duration (Weeks)	Work Effort (Man-hours)	Start Week	Man-hours Week 1/2/3/4
1	2	40	1	20 / 20 / 0 / 0
2	3	30	1	10 / 10 / 10 / 0
3	2	20	3	0 / 0 / 10 / 10
4	3	30	2	0 / 10 / 10 / 10

The overloaded situation is alleviated by using schedule slack to modify the start of one of Bill's activities. Notice:

- The duration of each task was held constant
- Hours were still EVENLY split amongst the planned work weeks
- The only modification was shift of the start time of activity 3 (see highlighted yellow area in work effort table)

Appendix A

Using Excel to Enhance Your Project Management Performance

How to build a Resource Histogram in Excel

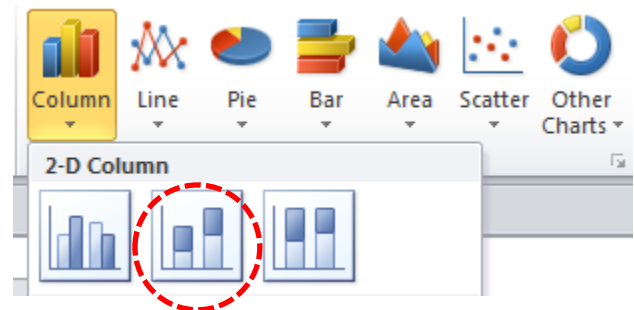
Step A: Enter the data

- Enter the Week Number Label in A1
- Enter the sequential week number (1 to N) starting in A2 to N rows below
- Enter the Activity Labels (1 to N) starting in B2 to N columns to the right
- For each Activity enter the work effort man-hours corresponding to the week that the activity will take place

	A	B	C	D	E	F
1	Week Number	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
2	1	10				
3	2	10	20	15		
4	3	5	20	15		
5	4		20		25	
6	5		20		25	
7	6		10			20
8						
9						
10						
11						
12						

Step B: Build the Graph

- From the Insert Chart Menu Select a 2D Stacked Column bar graph and Insert into the spreadsheet



- Add a number series for each Activity (1 to N); Make the Series Name the Label Entered for Each Activity. For Example:

Activity 1: Select B1 as the Series name, Select B2:B7 as the series values

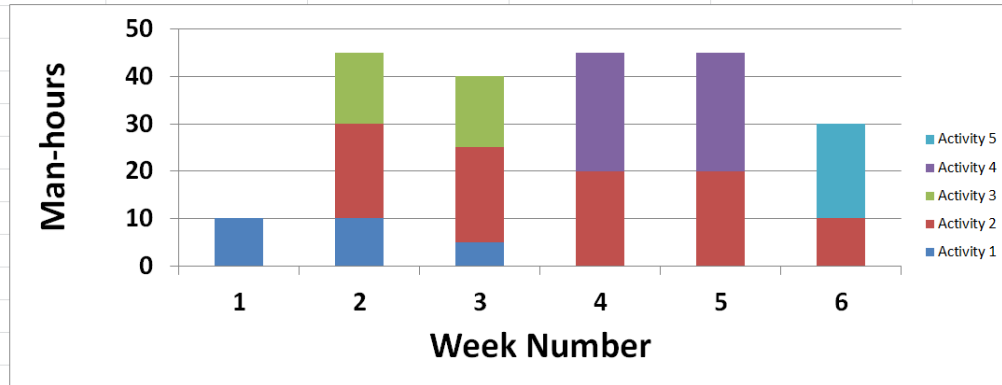
Activity 2: Select C1 as the Series name, Select C2:C7 as the series values

Activity 3: Select D1 as the Series name, Select D2:D7 as the series values

... Up to N activities

- Add a Rotated Vertical title on the Y-Axis Labeled “Man-Hours”
- Add a Primary Horizontal title on the X-Axis Labeled “Week Number”

	A	B	C	D	E	F
	Week Number	Activity 1	Activity 2	Activity 3	Activity 4	Activity 5
1	1	10				
2	2	10	20	15		
3	3	5	20	15		
4	4		20		25	
5	5		20		25	
6	6		10			20



SECTION IV

Who's Who on the Project

"Crocodiles are easy. They try to kill and eat you. People are harder. Sometimes they pretend to be your friend first."

- Steve Irwin "Crocodile hunter"



Digging deeper into the project justification you'll discover why the project was initiated and ultimately who are the key stakeholders. These are the people to satisfy in order to gain final acceptance and project completion – they have something to gain or lose in the project (directly or indirectly). Remember in Section I - Project Management Basics, we discussed how "Perception is Reality". Following are the simple steps to follow to better understand your stakeholders "reality" and how to give them what they want. It's known as Stakeholder Management in three easy steps: (1) Identify, (2) Rank, and (3) Understand.

STEP 1:

IDENTIFY YOUR STAKEHOLDERS

Unfortunately when you start a project you won't get a list of stakeholders, you will have to identify them yourself. But here are some key groupings to help you find them:

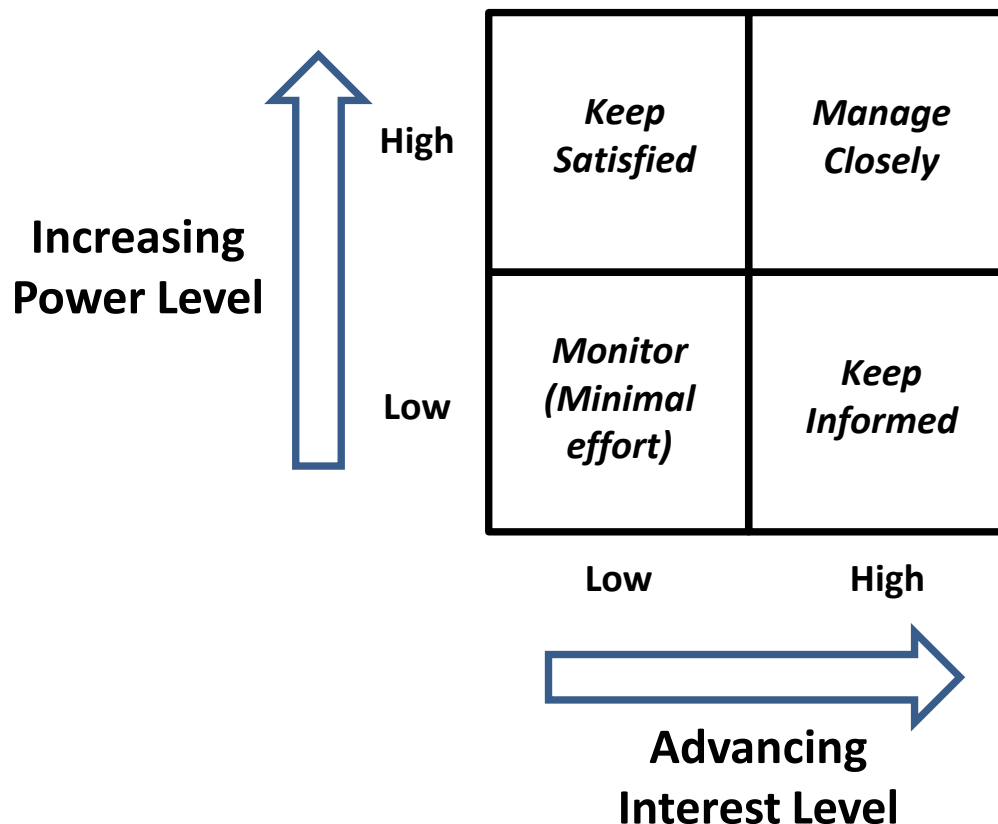
- Project initiator (sponsor) - the person whose original idea kicked the project off
- Project champion – a person in a high position in the client company that strongly supports the project and can act as an advocate for the project in disputes / planning
- Project drivers – those stakeholders that have a strong interest the project and will have say in defining the results of the project
- Project supporters – those stakeholders that will help the project team perform the project activities
- Beneficiaries – those that have an interest in the success of the project

STEP 2: RANK YOUR STAKEHOLDERS

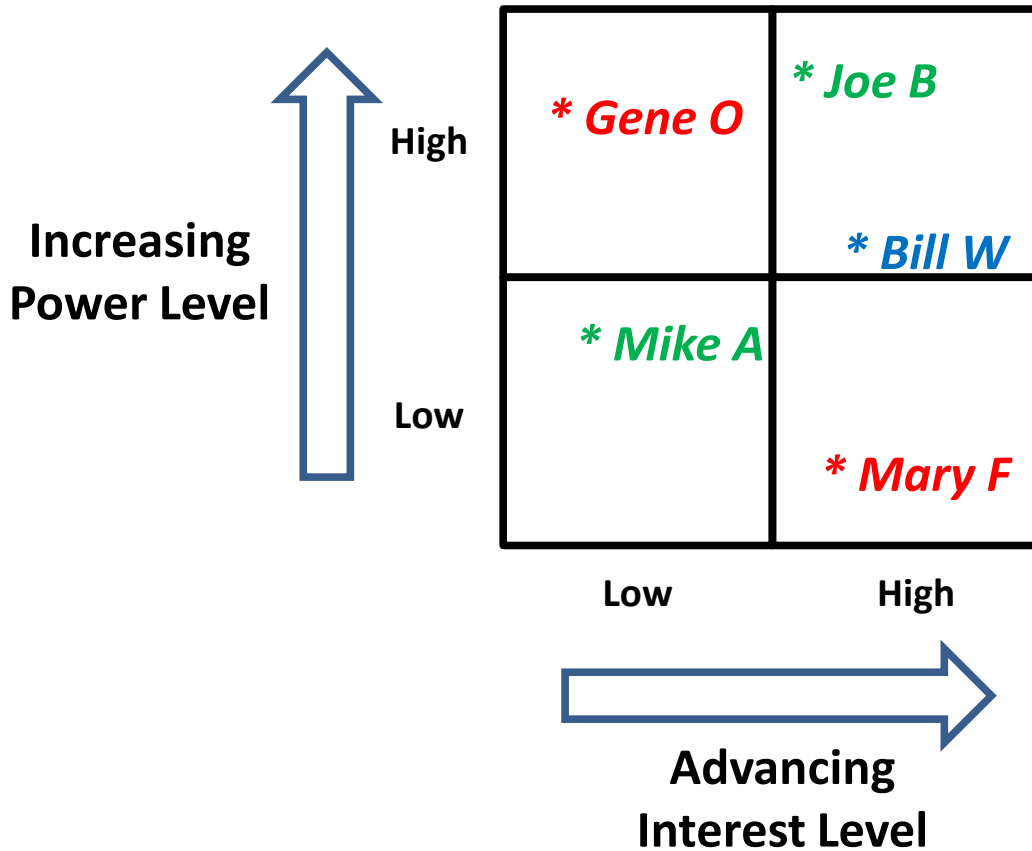


You will want to measure the stakeholders you identified in Step 1 in terms of power and interest over the project work. Next, we'll map them on a Power/Interest Grid and classify them by their power (influence) over the work and their interest in the project itself.

High Power – Interested People	You need to fully engage, communicate with a lot and take great efforts to satisfy – Manage Closely
High Power – Non-Interested People	Work with and communicate to this group enough to keep them engaged but not so much that they become overburdened and bored with the message – monitor for misinformation to ensure they do not turn to critics of the project – Keep Satisfied
Low Power – Interested People	Keep these informed and solicit feedback to ensure there are no major issues with the project – these are a very helpful group in planning details of the project – Keep Informed
Low Power – Non-Interested People	Provide informational posts but do not bore them with too much communication. Monitor this group less closely



Color coding names of the stakeholders on a Power/Interest Grid can help you identify project supporters (green), critics or blockers (red), and those that are neutral (blue).



STEP 3: RANK YOUR STAKEHOLDERS



In this final step of Stakeholder Management, you need to know more than that just who your key stakeholders are you need to know how they are likely to feel about and react to your project. You also need to know how best to engage them in your project and how best to communicate with them.

Following are examples of how and when your supporters are most useful in the project lifecycle.

Project Drivers **

Project Stage	Level of Involvement Needed	Why?	Risk of lack of Involvement
Initiation	High	Drivers have influence over a project's feasibility and play a big role in defining expected results	Missing an expectation could lead to disapproval of project results at the end
Organizing / Planning	High	Drivers help defining the expected results – they need to be part of the approval process in this stage	Not having approval sign-off could result in ambiguity of expectations at the end of the project
Performing the Work	Medium	Drivers moderate involvement in this stage reinforces the project needs/goals to the project team. Drivers involvement here also assures that project progress is meeting the defined expectations	Miss a chance to assure expectations of driver are being met
Project Close out	High	Drivers are key people in approving the project results	Lack of full approval of project results

** Including Project Initiator and champion

Project Supporters

Project Stage	Level of Involvement Needed	Why?	Risk of lack of Involvement
Initiation	Medium	Supporters can assess and provide feedback whether the drivers expectations of results are feasible	Driver expectations may be unattainable
Organizing / Planning	High	Supporters are actually helping perform the work and provide the guidance – they need to be part of the approval process in this stage	The project could miss needed technical guidance
Performing the Work	High	Supporters are actually helping perform the work and can help resolve issues and provide solutions to problems. Supporters help improve commitment with the project team	Missed opportunity to quickly resolve problems and issues with minimal impact – loss of commitment
Project Close out	High	Involved supporters will have influence in assuring the drivers the expectations have been met	Lack of full approval of project results by the drivers

Project Beneficiaries

Project Stage	Level of Involvement Needed	Why?	Risk of lack of Involvement
Initiation	Medium	Beneficiaries can provide input as to how the product will be utilized in the end and may provide historical insight on what has worked in the past	Project deliverables may not meet the true business need set forth to accomplish
Organizing / Planning	Low	Sharing the planned project output and schedule is suitable	Beneficiaries may not be able to provide timely input
Performing the Work	Low	Share minimal updates on schedule milestones and project achievements	Further loss of interest
Project Close out	Medium	Beneficiaries can act as your test group to ensure the deliverables work and function as planned	Lack of realistic input for future projects



Once you begin planning your project quickly identify a project champion. If you don't have one – recruit one. Your champion will need to have sufficient clout in the client organization to resolve issues and be willing to have their name associated as a strong supporter of the project. You will need “back-up”

SECTION V

How to Build Highly Effective Teams

More often than not, teams are formed merely by gathering some people together and then hoping that those people somehow find a way to work together. Teams are most effective when carefully designed. In order to design, develop and support a highly effective team, use the following guidelines:

**Set clear goals for the results to be produced by the team**

The goals should be designed to be “SMART.”

- Specific
- Measurable
- Achievable
- Relevant and
- Time-bound.

As much as possible, include input from other members of the organization when designing and wording these goals. Goal examples might be “by next year produce a project report that includes a project plan, schedule and budget to develop and test a complete employee performance management system.” Write these goals down for eventual communication to and discussion with all team members.

**Set clear objectives to measure effectiveness of the team**

The objectives, designed to achieve the overall goals, should also be designed to be “SMART.” Objectives might be, for example, to a) to produce a draft of a project report during the first four weeks of team activities, and b) achieve Board-approval of the proposed performance management system during the next four weeks. Also, write these objectives down for eventual communication to and discussion with all team members.

**Define a mechanism to ensure there is clear and consistent communications among team members**

New leaders often assume that all group members know what the leaders know. Consistent communication is the most important trait of a successful group. Without

communication, none of the other traits can occur. Successful groups even over-communicate, such that:

- All members regularly receive and understand similar information about the group, for example, about the group's purpose, membership, status and accomplishments.
- These communications might be delivered through regular newsletters, status reports, meetings, emails and collaboration tools.



Define a procedure to allow team members to make decisions and solve problems

Successful groups regularly encounter situations where they must make decisions and solve problems in a highly effective manner. Too often, the group resorts to extended discussion until members become tired and frustrated and eventually just opt for any action at all, or they count on the same person who seems to voice the strongest opinions. Instead, successful groups:

- Document a procedure whereby the group can make decisions and ensure that all members are aware of the procedure.
- The procedure might specify that decisions are made, first by aiming for consensus within a certain time frame and if consensus is not achieved, then the group resorts to a majority vote.



Develop staffing procedures (recruiting, training, organizing, replacement)

Too often, group members are asked to join the group and somehow to “chip in.” Unfortunately, that approach creates “chips,” rather than valuable group members. Instead, if group members go through a somewhat organized, systematic process, then new members often believe that the group is well organized and that their role is very valuable in the group. Successful groups:

- Identify what roles and expertise are needed on the group in order to achieve the group's purpose and plans – they staff according to plans, not personalities.
- New group members go through a systematic process to join the group – they understand the group's purpose, their role, their next steps and where to get help.



Determine the team membership criteria for the group

Consider the extent of expertise needed to achieve the goals, including areas of knowledge and skills. Include at least one person who has skills in facilitation and meeting management. Attempt to include sufficient diversity of values and perspectives to ensure robust ideas and discussion. A critical consideration is availability – members

should have the time to attend every meeting and perform required tasks between meetings.



Assign the role of the leader



The leader focuses on the systems and practices in the team, not on personalities of its members. For example, the leader makes sure that all team members: a) are successfully staffed, b) understand the purpose of the group and their role in it, c) are active toward meeting that purpose and role, and d) utilize procedures for making decisions and solving problems. (Note that the leader does not always have to be a strong, charismatic personality – while that type of personality can often be very successful at developing teams, it often can create passivity or frustration in other members over time, thereby crippling the group.)



Assign the role of communicator

Communication is the most important trait of a successful team. It cannot be left to chance. Someone should be designated to ensure that all members receive regular communications about purpose, membership, roles and status. Communications should also be with people outside the team, especially those who make decisions or determine if the team is successful or not.



Identify need for resources

Start from analysis of the purpose and goals. What is needed to achieve them? For example, members might benefit from a training that provides a brief overview of the typical stages of team development and includes packets of materials about the team's goals, structure and process to make decisions. Consider costs, such as trainers, consultants, room rental and office supplies. How will those funds be obtained and maintained?



Plan to Build Trust Through Team Building

Team building activities can include, for example, a retreat in which members introduce themselves, exercises in which members help each other solve a short problem or meet a specific and achievable goal, or an extended period in which members can voice their concerns and frustrations about their team assignments.



Regularly monitor and report on the team's status

It is amazing how often a team starts out with a carefully designed plan, but then abandons the plan once the initial implementation of the plan is underway. Sometimes if the plan is behind schedule, team members conclude that the project is not successful. Plans can change – just change them systematically with new dates and approval of the changes



Support team meetings and the members' roles

At this point, it is critical that supervisors of team members remain available to provide support and resources as needed. The supervisor should regularly monitor team members' progress on achieving their goals. Provide ongoing encouragement and visibility to members. One of the most important forms of support a supervisor can provide is coordination with other supervisors to ensure that team members are freed up enough to attend meetings.



Regularly celebrate!

One of the best ways to avoid burnout is to regularly celebrate accomplishments. Otherwise, members can feel as if they are on treadmill that has no end. Keep your eye on small and recurring successes, not just the gold at the end of the rainbow.

SECTION VI



Project Structure – The Matrix

To be effective in managing projects it is important to have an organizational structure in place to accurately define the activities in a project. Since a projects have many activities - from task allocation to budgeting and everything in-between - it is important to select an organizational structure that isn't too rigid, but efficient, flexible and possibly innovative.

Every organization is structured in some way, and that structure is determined by the organization's objectives. The way you structure an organization is going to offer a standard for operating procedures and routines. It will also determine who participates in what, and what project tools are best for the job at hand.

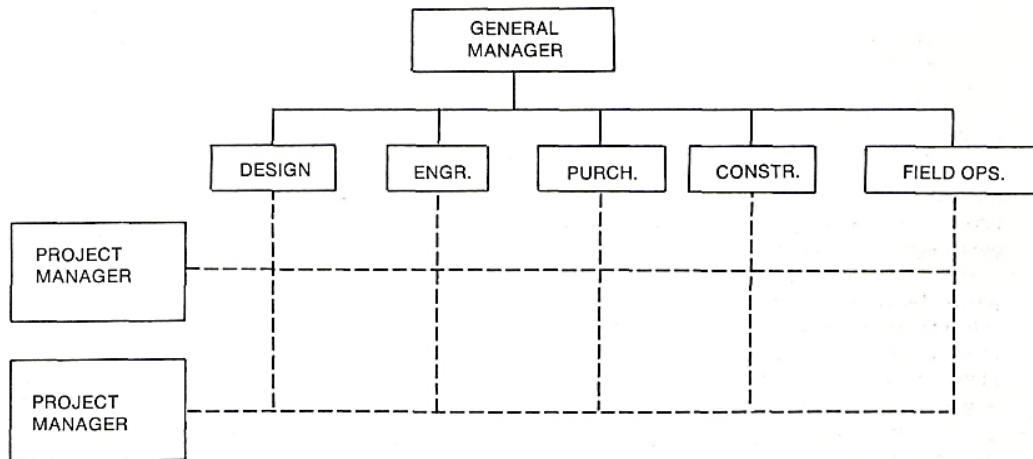
Matrix organizational structure is often used in project management because it blends the product of the project and the function of the management producing it.

Matrix Organization Defined

A matrix organization is defined as one in which there is dual or multiple managerial accountability and responsibility. In a matrix there are usually two chains of command, one along functional lines and the other along project, product, or client lines. Other chains of command such as geographic location can also possible.

The matrix organizational form may vary from one in which the project manager holds a very strong managerial position to one in which he plays only a coordinating role. To illustrate the organizational principles, a matrix will be considered first in which there is a balance of power between the project and functional managers.

The primary reason for adopting the matrix in a large organization can be pinpointed in the fact that functions and skills are fragmented throughout the organizational structure. Individual functional departments have great difficulty in solving very large problems because of a failure to view the total system and a tendency to sub-optimize or solve the problem within their particular discipline.



Matrix Organization



How Does the Matrix Work?

The matrix meets a number of well-defined needs. The principal need is for an organizational structure that can handle the great complexity of a multidisciplinary effort.

1. *Project Objectives Clear* — Project objectives are highly visible through the project office and also balanced with the objectives of the functional organization.
2. *Project Integration* — There is a clear mechanism to achieve project integration of subsystems and work packages across functional departmental lines. Coordination across functional lines is easily achieved
3. *Efficient Use of Resources* — The maximum efficient utilization resources with the most efficient use of manpower -- personnel can be used only part-time if desired, and can be shared between projects. It is the most efficient use of facilities, machinery, equipment, and other resources since these resources can be shared between or among projects. The matrix is therefore less expensive than an equivalent pure project organization.
4. *Information Flow* — Information dissemination is very effective since there is provisions for both horizontal and vertical flow.
 - Horizontal flow provides for project systems information to flow from functional unit to functional unit
 - Vertical flow provides for detailed disciplinary information to flow from project to project, and to various levels of management.
 - Information of use to other projects is not locked up within a single project.

5. *Retention of Disciplinary Teams* — Teams of functional experts and specialists are kept together even as projects stop. In this case specialists like to work with other specialists in the same discipline, and they will be better able to continually exchange ideas and information. As a result, there is increased innovation and productive output, even though individually they may be working on different projects.
6. *High Morale* — Morale problems occur less frequently since the worker in the matrix responds first to the morale-building experience of working on a successful project resulting in visible achievements.
7. *Development of Project Managers* — The matrix is an excellent training ground for prospective project managers. A person who can demonstrate an ability to work across functional departmental lines to the project office has opportunities for growth.
8. *Project Shutdown* — In a project shutdown there not the traumatic and painful event of disbanding the group. Matrix projects are normally smaller with fewer people overall involved and the people are spread across a whole functional organization.

Matrix Organization Cons



1. There can be some confusion when a team member is subject to two managers. That can also create unnecessary conflict. This is especially true if both managers have equal authority.
2. Functional manager vs Project manager. There can be conflict between the two managers in terms of what they believe to be the authority in the organization. That confusion can show up with team members, too, if their roles and responsibilities aren't clearly defined. And that confusion can lead to conflict if resources are hard to come by and competing managers are fighting for them.
3. There are a lot of managers in a matrix organizational structure – this can lead to a high cost structure -- beyond having multiple managers there is also the added expense of keeping on resources that might not be used all the time.
4. Team members can feel the strain of working in a matrix organizational structure, in that their workload can be heavy. Often, they're tasked with their regular assignments and then additional work, which can lead to burnout or some tasks being ignored.

Why Use a Matrix Organizational Structure?

The matrix organizational structure solves a problem of managing large and complex projects. When working on a large project, a highly hierarchical structure can be an obstacle in the path of moving that process forward successfully.

By not having the function and skills of team members fragmented in an organization the matrix layout allows the team structure to see a problem from a closer standpoint and have varied approaches of solving it.

<<< End Of Course – Part 2>>>