Sys·tem·a′·tion®

Getting Project Results Through Contract Resources

Pre-Reading Assignment

Overview of Project Processes

The Project Management Institute (PMI®) defines five project management processes that a typical project experiences during its life cycle. They are Initiating, Planning, Executing, Controlling, and Closing Processes. Within each of these elements are core and facilitating processes drawn from the nine project management knowledge areas: Project Integration, Project Scope, Project Time, Project Cost, Project Quality, Project Human Resource, Project Communication, Project Risk, and Project Procurement Management.

Project Human Resource Management includes the processes required to make the most effective use of the people involved with the project. If the use of people is not properly defined, executed and managed, any project is doomed to disappoint or fail in meeting its objectives within the dictated schedule and budget.

Two key processes within Project Human Resource Management are:

- **Organizational Planning –** Identifying, documenting, assigning project roles and responsibilities, and reporting relationships.
- **Staff Acquisition –** Obtaining the human resources needed assigned to and working on the project.

Project Procurement Management includes the processes required to acquire goods and services, to attain project scope, from outside the performing organization.

Reasons to use project procurement:

- A company may not have the resources to do the project themselves.
- The company may not have the knowledge or skill level to tackle the work effort themselves.
- Sometimes it is less expensive to buy a product someone else has already developed rather than building or designing your own.
- An outside source may be able to do the work faster and/or cheaper.

Overview of Project Processes, *continued*

Within Project Procurement Management are the following processes:

- **Procurement Planning –** Determining what to procure and when.
- **Solicitation Planning** – Documenting product requirements and identifying potential sources.
- **Solicitation –** Obtaining quotations, bids, offers, or proposals, as appropriate.
- **Source Selection** – Choosing from among potential sellers.
- **Contract Administration** – Managing the relationship with the seller.
- **Contract Closeout** – Completion and settlement of the contract, including resolution of any open items.

Planning processes must include all of the steps to plan the project in a realistic and doable fashion. Within planning, organizational planning and staff acquisition play a major role. They provide the structure for organizing the work effort and having the right talent at the right time to do the work. Procurement planning and solicitation planning are also normally performed as part of the planning process.

Procurement Planning

Procurement planning determines which project activities are going to be performed by an outside source as part of the project strategy or approach.

Solicitation Planning

Solicitation planning ensures that the project plan incorporates the tasks and timing of those activities necessitated by the decision to rely on an outside vendor.

Source Selection

When the decision has been made to move ahead with the executing processes, the actual selection of a vendor must move forward. Solicitation, source selection and contract administration processes will be performed.

Overview of Project Processes, *continued*

Contract Administration

Contract administration is also involved with the controlling processes, since the project manager must control all elements of the project from a scope, schedule, cost, quality, and risk perspective. Control must apply to both in-house and external work. Two elements of this control involve performance reporting and integrated change control.

Contract Closeout

The contract closeout occurs as part of the closing process and addresses the closing activities as they relate to the vendors performing work on the project.

Organizational Planning

Organizational planning involves identifying, documenting, and assigning project roles and responsibilities, and reporting relationships. Roles define who does what, and responsibilities define who decides what. Both roles and responsibilities have to be assigned to the right stakeholders. Reporting relationships deal with the organizational structure of the project as it relates to the organizational structure of the company. Reporting relationships dictate how work is directed and managed plus it can also complicate the control of the project. The PMBOK® Guide emphasizes, "Organizational planning is often tightly linked with communications planning, since the project's organizational structure will have a major effect on the project's communications requirements."

Vijay K. Verma states in his book, *Organizing Projects for Success*, "Designing an organization is the process of selecting a structure and the formal systems of communication, division of labor, coordination, control, authority, and responsibility necessary to achieve organizational goals." Verma further amplifies that "A good organization design eases the flow of information and decision making, clarifies authority and responsibility, and creates the desired levels of coordination between departments."

Why is organizational design important in projects? Every project represents the bringing together of stakeholders from different work areas or functions to focus on the completion of a project's goal. Even though the assembled group may be together as a temporary organization, factors relative to organizational design must be considered. A well-organized project structure can make the execution and control of the project much easier. Of course, the project manager doesn't always have a lot of say on how a company organizes, but many of these elements can help the project manager better organize their project team. In addition, an understanding of organizational design will enable the project manager to better understand how various constraints, obstacles, and challenges might affect their ability to manage the project.

Inputs

When a project manager starts organizational planning during the planning process, a number of factors or inputs must be considered.

These are:

- Project interfaces
- Staffing requirements
- Project constraints

To determine the interfaces involved, the project manager must first determine all of the stakeholders associated with the project. The project charter is usually an excellent starting place for the project manager to understand the nature of this new effort. Discussions with the sponsor and customer/client will also provide information. This information gathering is usually sufficient to assemble an initial team to start planning. The people and organizations that need be involved with the project become clearer as this initial team conducts the planning process. The scope statement and scope definition further reveal and clarity the interfaces that must be considered for the project.

PMI® breaks down these interfaces into three subcategories:

- **Organizational interfaces –** "formal and informal reporting relationships among different organizational units." This view examines the different departments, branches, offices, and subcontractors that might be involved in the project. Depending on the scope of the effort, the organizational interfaces might range from few to many.
- **Technical interfaces –** "formal and informal reporting relationships among different technical disciplines." Technical interfaces occur both within project phases and between project phases. An example of the formal is when the engineers designing a new car engine must ensure that the engine's size and power are compatible with both the car body being designed by the structural engineers and the drive system being developed by the transmission team. An example of a transfer between project phases is when the development team turns over the car design to the manufacturing team.
- **Interpersonal interfaces** – "formal and informal reporting relationships among different individuals working on the project." This takes the interfaces down to the individuals involved in the actual work effort. It includes formal reporting relationships, barriers, and other factors that may either support or hinder the individuals being able to work together on the project.

Inputs, *continued*

Staffing requirements are another required input to organizational planning. From the scope definition the team can start resource planning. Resource planning yields a description of what types and quantities of resources are required. Among the requirements generated from resource planning are the staffing requirements in terms of the skills or competencies required by the parties involved in the project. The number of people needed will continue to be refined as the sequencing and scheduling are done.

Knowledge of the project constraints is the third input to organizational planning. The constraints considered here are those that limit the options concerning the organizational design of the project.

Among those that can affect the design are:

- Collective bargaining agreements.
- The way the overall organization is organized for projects.
- Priority of the project.
- Preferences of the project team or key leadership, such as the sponsor or project manager.
- Experience and skill level of those assigned to the project.

Tools and Techniques

PMI® lists four tools and techniques that can contribute to organizational planning.

They are:

- Templates
- Human resources practices
- Stakeholder analysis
- Organizational theory

Templates

Templates refer to the organizational diagrams of projects that have been performed in the past. Sometimes a scheme is copied from a previous project. In other cases, organizations have developed generic templates that describe how various types of projects should be organized. Relying on such information can help expedite the organizational design of the new project and make it easier to define roles and responsibilities, and even reporting relationships.

> **TIP**
> *Even if the organization doesn't have formal templates, ask other project managers how they have organized similar projects in the past.*

Human Resource Practices

Human resource practices are another area that the project manager must understand when doing organizational planning. The project manager must be knowledgeable of the organization's policies, procedures, guidelines, and manuals regarding human resources and organizational design. Knowledge prevents the project manager from trying an approach that violates a policy and also enables the project manager to take advantage of any procedures or concepts that are encouraged by the organization.

Stakeholder Analysis

Stakeholder analysis is another technique that should be used. Identifying potential stakeholders was done initially to determine the different interfaces that might be involved in the project. Stakeholder analysis builds on the initial identification of stakeholders. Some of the key factors to be considered in stakeholder analysis are stakeholder needs, concerns, and timing of involvement of the different participants. Other factors that should be analyzed are with whom do they need to interface throughout the project, and what are their information requirements.

Stakeholder analysis is important to ensure that the final organizational design will satisfy the needs of all the stakeholders. In addition, the stakeholder analysis is a tool that will also contribute to communication planning. As stated earlier, communication planning and organizational design are tied together.

An organized and formal approach to stakeholder analysis should always be used. This should never be on the back of the envelope scribbling notes. Determining this information in a more formal way ensures that the analysis is performed in a thorough manner and produces a record that can be used for the purposes identified above. Getting the right stakeholders involved in this analysis helps ensure the accuracy of the information and sends a powerful message that their needs and concerns are important to the project manager.

TIP

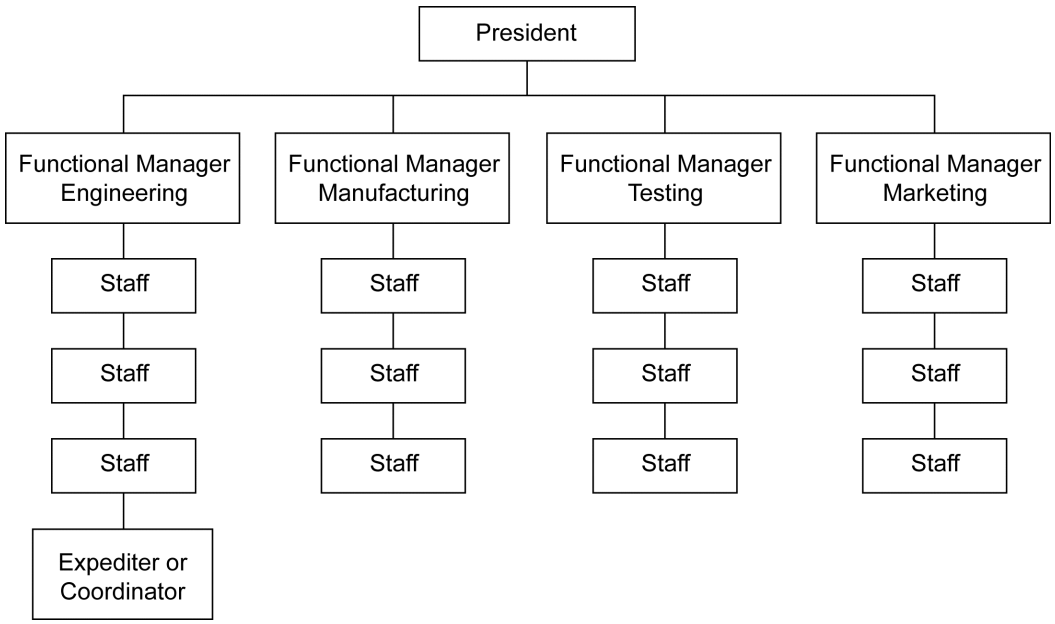
A table is a great way to capture the results of a stakeholder analysis. Shown on the next page is a simple example.

Stakeholder Analysis, *continued*

Party	Need	Concern	Involvement	Interface With	Info Requirements
Project Manager	Deliver on time, within budget Meet specs	Tight schedule Obtaining adequate resources	Full-time Daily	All Stakeholders	Work progress Status updates
Customer	Final Product On schedule	Must meet business objectives	Beginning to end As needed	Project Manager and Core Team	Status updates
Sponsor	Deliver on time, within budget Meet specs	Must meet business objectives	Beginning to end Part-time	Project Manager and Core Team	Status updates
Engineering	Clear requirements	Tight schedule	Full-time Daily	Project Manager, Customer and Core Team	Business needs Requirements definition Coordination with other team members
Manufacturing	Complete design	Design not complete Design not producible Not enough time allowed for work	Part-time as needed during design Full-time during manufacturing development and manufacturing operation	Project Manager, Customer and Core Team	Producibility inputs Manufacturing requirements Coordination with other team members
Test	Clearly defined specs Adequate resources	Not enough time allocated for testing Staying informed	Part-time involvement during early phases Full-time during testing	Project Manager and Core Team	Testing requirements Coordination with other team members
Vendors	Clear direction Adequate support	Want to excel Don't want to lose money	Full-time once contract awarded Weekly involvement	Project Manager	Contract Status updates Coordination with Project Manager
Local Government Agencies	Compliance with all permits	Safety or other regulatory violations	Periodic during project	Project Manager	Permits Inspections

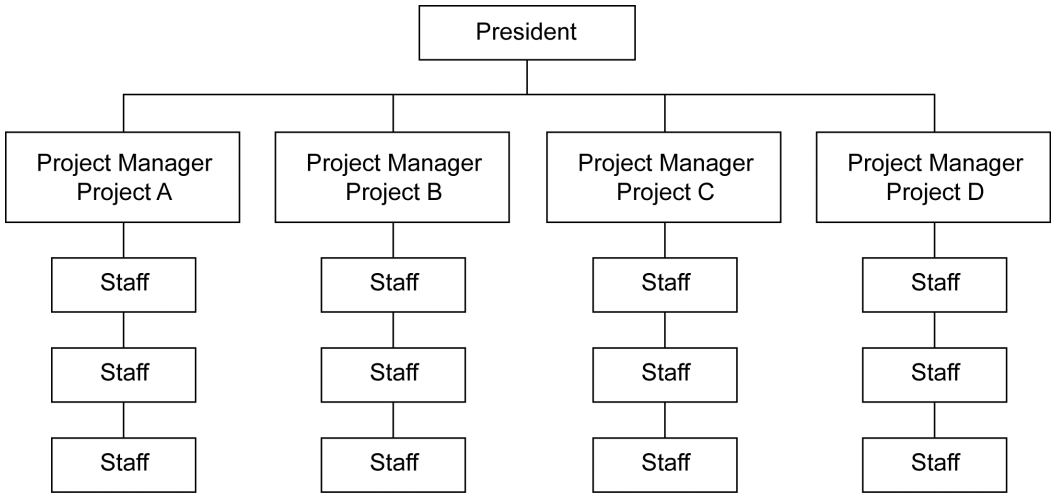
Organizational Theory

The last tool or technique to be discussed is organization theory. Three of the most common organizational structures are the functional, matrix, and projectized structures. Shown below is the functional organizational where the organization is built around the different functional elements. Projects tend to be focused within functional elements and are managed by a manager within that function. If the manager is too busy to deal with the day-to-day details, a person may be selected to act as a project expeditor or coordinator. Projects that cross-functional boundaries can be difficult to manage since coordination sometimes must occur between senior managers in the functions involved.



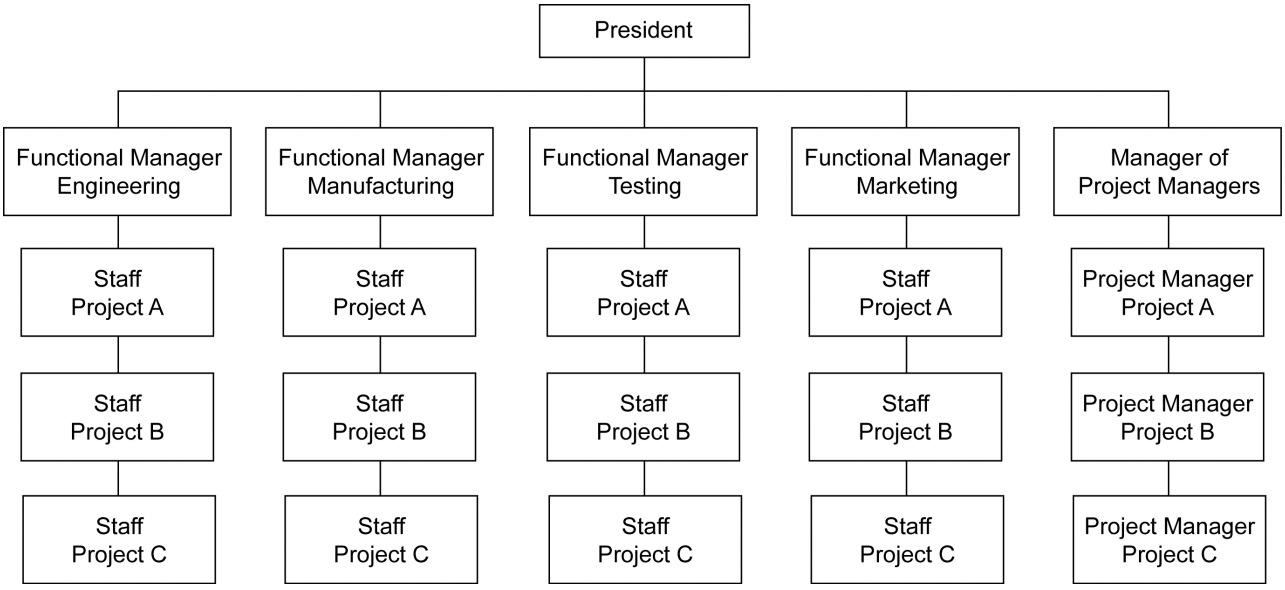
Organizational Theory, *continued*

Shown next is the projectized organization where the structure is developed around individual projects. The organization is focused on each of the projects being undertaken. Personnel are assigned to the project and remain associated with that project until the project ends. Within each project organization, all leadership and direction is on the project itself.



Organizational Theory, *continued*

The last organization design is the matrix. This design is a combination of the functional and the projectized. The functional organizations exist and work to fulfill the company's needs regarding their discipline. Projects are treated as temporary organizations. Functional team members are assigned to projects as needed. Their length of assignment is for the time needed to make their contribution. Project managers are assigned to each project from their own project organization. Staffs are subject to receiving direction from both the project manager and their functional leadership.



Organizational Theory, *continued*

Each has its strengths and weaknesses as shown in the table below.

TYPE	STRUCTURE	STRENGTHS	WEAKNESSES
Functional	Traditional organization with senior leadership at top and staff grouped within functional specialties	Can lead to strong functional capability because of focus within work area	Coordination across functional work areas more difficult because project manager may have little authority
		Specialists sit together promoting shared expertise	Overall responsibility for a project may be unclear
		Mutual support within specialty	Focus may be inward. Stovepipe mentality
		Clear career path	Other functional areas may be viewed negatively
		Clear definition of responsibility	Customer may be unsure of who to contact concerning project
Projectized	Senior management at top but below organized around individual projects	Project Manager clearly responsible, accountable, and has authority	Expensive because each project demands separate organization
		Team members collocated	Sharing of info between projects may be reduced
		Project loyalty high	Duplication of facilities
		Increases communication between team members	Inefficient use of resources since team members may be retained even though workload is part-time
Matrix	Blend of functional and projectized	Project Manager is focal point for effort	Project manager may have a lot or little authority
	Project manager and team assigned to temporary organization	Team members assigned only as long as necessary. Efficient use of resources.	Violates one boss rule. Team members are accountable to project manager and functional supervisor
		If part-time can be used on multiple projects	Use of team members on multiple projects complicates planning and execution
		Promotes sharing of lessons learned	

Organizational Theory, *continued*

Within the matrix approach, different situations exist depending on the amount of authority the project manager possesses. A matrix approach can vary from a weak matrix to a strong matrix situation. The table shown below is taken from PMI®'s PMBOK® Guide.

Organizational Structure Project Characteristics	Functional	Weak Matrix	Balanced Matrix	Strong Matrix	Projectized
Project Manager's Authority	Little or None	Limited	Low to Moderate	Moderate to High	High to Almost Total
Percent of Performing Organization's Personnel Assigned Full Time to Project Work	Virtually None	0-25%	15-60%	50-95%	85-100%
Project Manager's Role	Part-time	Part-time	Full-time	Full-time	Full-time
Common Titles for Project Manager's Role	Project Coordinator/ Project Leader	Project Coordinator/ Project Leader	Project Manager/ Project Officer	Project Manager/ Program Manager	Project Manager/ Program Manager
Project Management Administrative Staff	Part-time	Part-time	Part-time	Full-time	Full-time

As the table indicates, the type of organization can affect the authority the project manager possesses. Even in the matrix approach, the authority of the project manager can vary from limited to high depending on the authority allowed the project manager versus the functional management. In a weak matrix organization, the project manager has limited authority. Most of the authority rests with the functional managers. The strong matrix approach reverses the situation. Another point to note from the table is that the role of the project manager also varies from part-time to full-time.

While many people refer to the leader of a project as the project manager, the role of the leader can vary and many times this variance is driven by the organizational arrangement. In a functional approach, the power and authority are with the functional leadership. In such a situation, the project leader may be more of an expeditor or coordinator. This arrangement also exists many times in a weak matrix organization. Both the expeditor and coordinator tend to focus on project administrative matters as opposed to project management leadership of the project.

Organizational Theory, *continued*

A project expeditor has little formal authority. An expeditor relies on strong interpersonal skills to influence and keep the project moving forward. In many cases, the expeditor also relies on their ability to pass on information and suggestions to someone higher in the organizational structure that is interested in the project. The expeditor usually cannot issue orders or tell people what to do.

According to Verma, an expeditor's role in a weak matrix organization may be to:

- "Identify critical areas with suggestions to resolve problems issues.
- Expedite major components and activities to meet the target schedule.
- Forward decisions made by functional and project managers and communicate back any problems, with suggestions to resolve them.
- Promote communication among project team members.
- Help management monitor the project's progress on a regular basis".

A project coordinator has more authority than an expeditor. In this role the person's authority has been expanded from one of merely facilitating to one of active coordination. Interpersonal skills are still vitally important.

A coordinator's role in a weak matrix organization may include the following:

- The coordinator has a formally defined role with regard to the project.
- The coordinator has the authority to act within certain specific limits.
- The coordinator can assign activities to individuals in the functional work units after consultation with the team members' supervisors.
- The coordinator can influence the decision-making process regarding the priority and allocation of resources in order to complete project tasks.

Organizational Theory, *continued*

Other factors that go into organizational design are:

- **Unity of Command –** no one should have more than one boss. On a project it should be clear from whom a team member takes direction concerning project activities.

- **Span of Management or Control –** this refers to the number of team members who report directly to the project manager or a leader within the project team. Too many people reporting to one manager can result in inadequate supervision and control. Having too few people reporting to each manager can be very inefficient, because more managers must be assigned using up valuable resources and adding needless levels of management hierarchy.

- **Clarity of Management Chain –** on each project a clearly defined and visible chain of command must exist from the team member up to the project manager and sponsor. If a team member needs a decision, needs clarification concerning direction or wants to raise an issue, the person they must consult should be clearly evident to them.

- **Clearly Defined Roles and Responsibilities –** each organization involved in the project along with the team members from that organization must understand who does what and who decides what.

- **Parity in Authority and Responsibility –** individuals in the project organization must be empowered for success. They must have the requisite authority that enables them to complete the activities for which they are responsible.

- **Clear Lines of Communication and Integration –** the design must also permit timely and effective communication between different functional groups both for sharing information and working to develop integrated solutions that will meet the needs of all stakeholders.

Outputs

Four key outputs should be obtained as a result of organizational planning.

These are:

- Roles and responsibility assignments
- Staffing management plan
- Organization chart for the project
- Supporting detail

Roles and Responsibility Assignments

To clearly define these elements for the project, a Responsibility Assignment Matrix (RAM) is normally built. This matrix can be constructed at varying levels of detail depending on the needs of the project. At a high level, the matrix can delineate the roles and responsibilities of individuals for overall portions of project work. At a more detailed level, the matrix can indicate individual roles and responsibilities for tasks from the Work Breakdown Structure (WBS). The matrix is a powerful tool for clearly defining and gaining agreement from stakeholders. Samples of two types of RAMs are shown below and on the next page. The first examines roles throughout the project life cycle.

Function / Phase	Project Manager	Sponsor	Customer	Engineering	Test	Marketing
Planning	A, R and S	S	I and R	I and R	I and R	I and R
Requirements Definition	P and S		I and R	I, A, R, and S	I	P
Design	P and S	R	P	I, A, R, and S	I	P
Development	P and S	R	P	I, A, R, and S	I	P
Testing	P and S	R	P	P	I, A, R, and S	P
Implementation	P and S	R	I, R, S	P	P	A, R, and S

P = Participant A = Accountable R = Review Required I = Input Required
S = Sign-off Required

Roles and Responsibility Assignments, *continued*

The next shows how a table can correlate who on the team will be involved in each of the individual project activities. Any task without an assignment must either be handled by the project manager, and may be in danger of not being finished on time.

PERSON / TASK	Jack	Sue	Mary	Bob
WBS 1.3.1	I	I and R	R and S	
WBS 1.3.2	I	I and R	R and S	
WBS 1.4.1	P		R and S	I
WBS 1.4.2	P		R and S	I
WBS 1.4.3	P		R and S	I

P = Participant A = Accountable R = Review Required I = Input Required
S = Sign-off Required

The coding shown is for example purposes only. Each project team should select coding elements that make the most sense for their area.

P = Involved in discussions.
A = Held accountable for activity getting finished. Normally a single person.
R = Reviewed the work to ensure it was satisfactory and complete.
I = Involved in the discussions and required to supply an input to the final product. If a person designated by an "I", a "P" is unnecessary.
S = Required to sign off once the work is satisfactory and complete.

The Staffing Management Plan

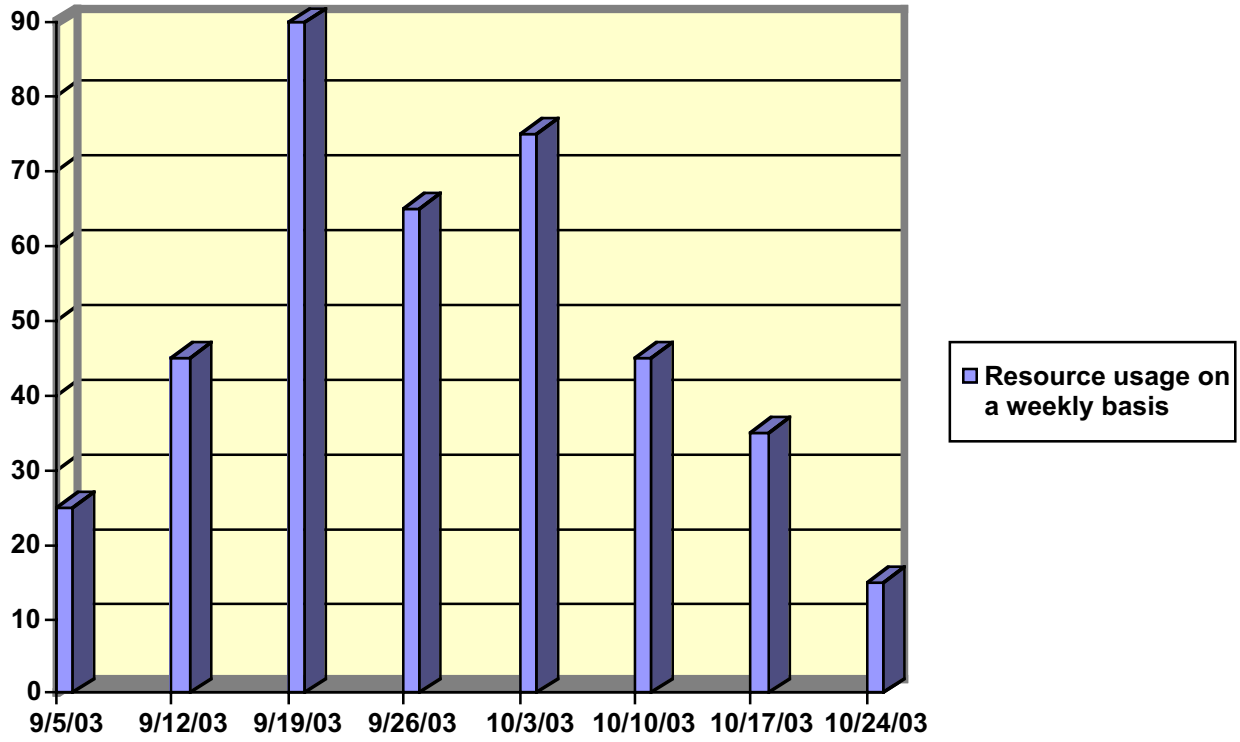
The Staffing Management Plan is another output of organizational planning. This plan describes the approach for moving people onto and off the project team. The plan is usually a section of the project plan. The staffing management plan for a small project may be informal with general concepts whereas the plan for a large project will be more detailed and formal. The plan should also be consistent with the assignment system or practices of the company.

For part-time personnel or team members who will join the project for certain activities and then be released, the factors driving their assignments should be specifically listed. If a programmer is to be brought on the project once a module has been designed, the linkage should be specified, especially if the timeframe could slip. Likewise, the factors that will permit the release of team members should also be listed. These specifics are necessary to manage expectations. The coordination of the staffing management plan with the supervisors involved will help avoid conflicts downstream.

A resource histogram can also be included in the staffing management plan. It is a bar chart that shows the usage of resources from the beginning of the project to the end. The purpose of the histogram is to show the number of resources being used by the project at any time. Many organizations like to avoid large ups and downs in the quantity of resources being used, since the adding and removing of resources can lead to inefficiencies. They strive to ramp up to an appropriate level and maintain this level until it is time to start releasing people from the project.

The Staffing Management Plan, *continued*

An example of a resource histogram is shown below.



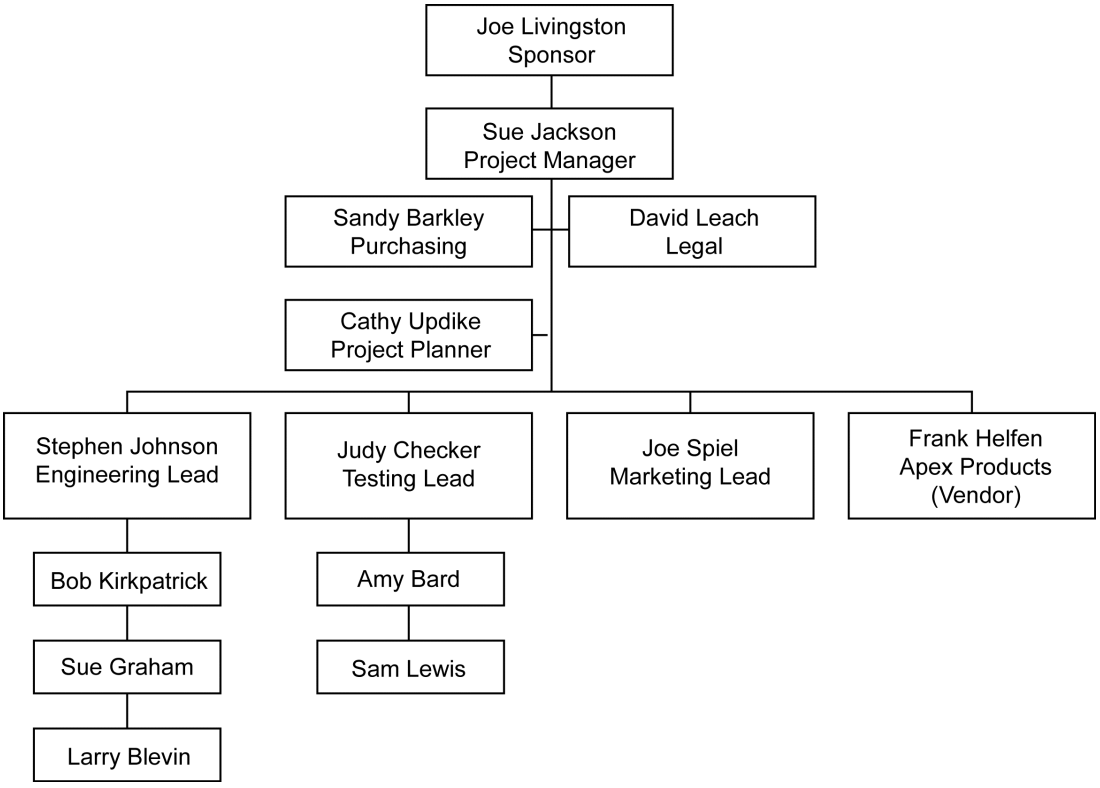
Project Organizational Chart

Another output from organizational planning is the project organizational chart. In organizational planning, the project manager is concerned with defining roles and responsibilities, and reporting relationships. The Responsibility Assignment Matrix addresses the first two whereas the organizational chart covers the reporting relationships.

The degree of detail in an organizational chart is dictated by the needs of the project. A project involving 4 people may require very little detail regarding the organizational chart. On the other hand, a project involving 80 people from 14 different organizational elements may demand a detailed and very formal organizational chart to clearly define all of the reporting relationships. In developing the organizational chart, some of the guidelines previously discussed should be kept in mind. These are unity of command, span of control, clarity of the management chain, and clear lines of communication and integration.

PMI® defines an Organizational Breakdown Structure (OBS) as a "specific type of organizational chart that shows which organizational units are responsible for which work packages." This sometimes is confused with the WBS.

Shown below is an example of an organizational chart. If vendors are going to be involved in the project, the chart should include them to indicate how they will report into the overall structure.



Supporting Detail

The last output from organizational planning is supporting detail. Supporting detail represents documentation that adds to or clarifies the work performed in organizational planning. For example, it could include a list of training requirements if team members need to acquire additional skills in order to carry out their project assignments. In a company with a formal assignment system, the supporting detail might include job descriptions or position descriptions. These describe in detail the qualifications of personnel in various positions within the company. Position descriptions can aid the search for certain skills that are needed on the project. Yet another type of documentation might be a summary of the impacts of organizing the project in a certain way. The impacts might be a weighing of pros and cons. It might also be pointing out what limitations can impact the organization because the project has been organized in a certain fashion. Typically this supporting detail is created as needed for the project or as dictated by senior management. Formal documentation of any agreements reached among the different stakeholders might be another output. Such documentation could prevent future disagreements on responsibilities or other details of how the organization will function.

Assignment – Organizational Planning Exercise

INSTRUCTIONS

1. Read the scenario below.

2. Prepare a responsibility assignment matrix for the stakeholders that illustrates their responsibilities with regard to typical work activities throughout the project. The major activities are project plan, project schedule, requirements definition, final building design, use of the land space, procurement of computers, procurement of software, office layouts, phone system design, parking layout, and move in schedule. Use the following codes are needed:
   P = Participant A = Accountable R = Review Required I = Input Required
   S = Sign-off Required

3. Prepare an organizational chart of how you see the team operating throughout this project.

4. Be prepared to share your results during the workshop.

OBJECTIVES

1. To become familiar with the key elements that should be considered in creating a responsibility assignment matrix and an organizational chart.

2. To have experience developing the responsibility assignment matrix and the organizational chart.

SCENARIO

Your company is designing and building a new regional office to be near Denver, Colorado. This new office is being designed from the ground up. The design work includes acquiring the land, obtaining all permits, and formulating the design of the building exterior and interior.
All furnishings and equipment for the building must be purchased and installed. The building will be constructed on a beautiful site adjacent to a nature reserve containing numerous endangered species.

This construction project represents the first new regional office to be built in over 12 years. Everyone in the company has strong ideas on what should be included. The President of the company, Mary Decker, wants to make sure her vision is contained in the look and feel of the building. The Operations Director, Robert Lewis, wants the building to contain all state of the art equipment along with maximum flexibility to respond to future initiatives quickly. The Operations Director is the sponsor for the project, and the operation of the facility falls under the Operations Directorate. The IT Director, John Ward, wants to have the building designed with computer capability that interfaces with the equipment at the headquarters and the other regional offices. The IT Director wants to go with new equipment and software that will set the standard for upgrades at the other sites. Traditionally all approvals for computers and software require the signoff of the IT Directorate and the requesting user's directorate. Each of the other directorates (Human Resources, Marketing and Sales, Purchasing, and Distribution) are concerned no one will listen to their needs. Many previous projects required extensive rework as a result.

Other major players on this project are the outside vendors, especially the architecture firm (B Standish and Snyder), and the lead building contractor (Adams Construction). Numerous building subcontractors are envisioned. The office furniture company, computer suppliers, software suppliers, and moving company are also players.

The project organization will be a matrix approach. A project manager, Lori Smith, has been selected to manage the effort from beginning to end. Team members will be selected from each of the directorates. Each directorate will have a lead person assigned responsible for that directorates interests with regard to the project. The current leads are:

Operations:	Joe Spellman
IT:	Jackie Connors
Human Resources:	Susan Jackson
Marketing and Sales:	Allison Smith
Purchasing:	Fred Leach
Distribution:	Sam Trotman