Chapter

1

What Is a Project?

Congratulations on your decision to study for and take the Project Management Institute (PMI) Project Management Professional (PMP) certification exam. This book was written with you in mind. The focus and content of this book revolve heavily around the information contained in *A Guide to the Project Management Body of Knowledge (PMBOK, Guide) Third Edition*, published by PMI. I will refer to this guide throughout this book and elaborate on those areas that appear on the test. Keep in mind that the test covers all the project management processes, so don't skip anything in your study time.

When possible, I'll pass on hints and study tips that I collected while studying for the exam myself. Your first tip is to familiarize yourself with the terminology used in *A Guide to the PMBOK*. Volunteers from differing industries worked together to come up with the standards and terms used in the guide. These folks have worked hard to develop and define standard project management terms, and these terms are used interchangeably among industries. For example, *resource planning* means the same thing to someone working in construction, information technology, or telecommunications. You'll find *A Guide to the PMBOK* terms explained throughout this book. Even if you are an experienced project manager, you might find you use specific terms for processes or actions you regularly perform but *A Guide to the PMBOK* calls them by another name. So, step one is to get familiar with the terminology.

This chapter lays the foundation for building and managing your project. We'll address project and project management definitions as well as organizational structures. Good luck!

Is It a Project?

Consider the following scenario: The VP of marketing approaches you with a fabulous idea—"fabulous" because he's the big boss and because he thought it up. He wants to set up kiosks in local grocery stores as mini offices. These offices will offer customers the ability to sign up for new wireless phone services, make their wireless phone bill payments, and purchase equipment and accessories. He believes that the exposure in grocery stores will increase awareness of the company's offerings. After all, everyone has to eat, right? He told you that the board of directors has already cleared the project and he'll dedicate as many resources to this as he can. He wants the new kiosks in place in 12 stores by the end of next year. The best news is he's assigned you to head up this project.

Your first question should be, "Is it a project?" This may seem elementary, but confusing projects with ongoing operations happens often. Projects are temporary in nature, have definite start and end dates, result in the creation of a unique product or service, and are completed when their goals and objectives have been met and signed off by the stakeholders.

When considering whether or not you have a project on your hands, there are some things to keep in mind. First, is it a project or an ongoing operation? Next, if it is a project, who are the stakeholders? And third, what characteristics distinguish this endeavor as a project. We'll look at each of these next.

Projects versus Operations

Projects are temporary in nature and have definitive start dates and definitive end dates. The project is completed when its goals and objectives are accomplished. Sometimes projects end when it's determined that the goals and objectives cannot be accomplished or when the product or service of the project is no longer needed and the project is canceled. Projects exist to bring about a product or service that hasn't existed before. This may include tangible products, services such as consulting or project management, and business functions that support the organization. Projects may also produce a result or an outcome, such as a document that details findings of a research study. In this sense, a project is unique. However, don't get confused by the term *unique.* For example, Ford Motor Company is in the business of designing and assembling cars. Each model that Ford designs and produces can be considered a project. The models differ from each other in their features and are marketed to people with various needs. An SUV serves a different purpose and clientele than a luxury model. The design and marketing of these two models are unique projects. However, the actual assembly of the cars is considered an operation—a repetitive process that is followed for most makes and models.

Determining the characteristics and features of the different car models is carried out through what *A Guide to the PMBOK* terms *progressive elaboration.* This means the characteristics of the product or service of the project (the SUV, for example) are determined incrementally and are continually refined and worked out in detail as the project progresses. This concept goes along with the temporary and unique aspects of a project because when you first start the project, you don't know all the minute details of the end product. Product characteristics typically start out broad based at the beginning of the project and are progressively elaborated into more and more detail over time until they are complete and finalized. Keep in mind that product characteristics are progressively elaborated but the work of the project itself stays constant.

Exam Spotlight

Progressive elaboration is a concept you may encounter on the exam. Know this concept as it's described in *A Guide to the PMBOK.*

Operations are ongoing and repetitive. They involve work that is continuous without an ending date and you often repeat the same processes and produce the same results. The purpose of operations is to keep the organization functioning while the purpose of a project is to meet its goals and to conclude. Therefore, operations are ongoing while projects are unique and temporary.

Stakeholders

A project is successful when it achieves its objectives and meets or exceeds the expectations of the stakeholders. *Stakeholders* are those folks (or organizations) with a vested interest in your project. They are the people who are actively involved with the work of the project or have something to either gain or lose as a result of the project.
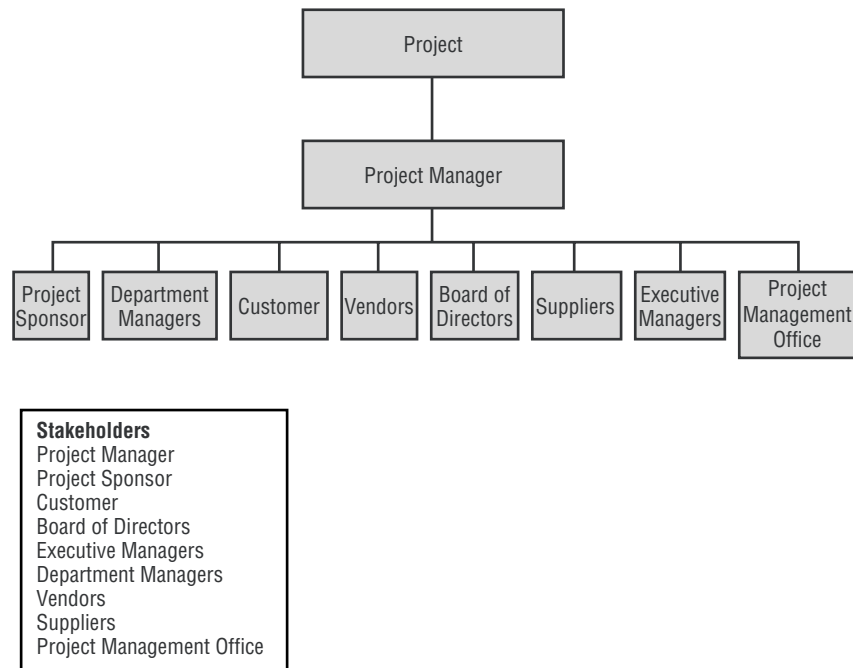
> **NOTE** Key stakeholders can make or break the success of a project. Even if all the deliverables are met and the objectives are satisfied, if your key stakeholders aren't happy, nobody's happy.

The *project sponsor,* generally an executive in the organization with the authority to assign resources and enforce decisions regarding the project, is a stakeholder. The customer is a stakeholder, as are contractors and suppliers. The project manager, project team members, and the managers from other departments in the organization are stakeholders as well. It's important to identify all the stakeholders in your project up front. If you leave out an important stakeholder or their department's function and don't discover the error until well into the project, it could be a project killer.

Figure 1.1 shows a sample listing of the kinds of stakeholders involved on a typical project.

FIGURE 1.1   Project stakeholders

Stakeholders
Project Manager
Project Sponsor
Customer
Board of Directors
Executive Managers
Department Managers
Vendors
Suppliers
Project Management Office

Many times, stakeholders have conflicting interests. It's the project manager's responsibility to understand these conflicts and try to resolve them. It's also the project manager's responsibility to manage stakeholder expectations. Be certain to identify and meet with all key stakeholders early in the project to understand all their needs and constraints. And when in doubt, stakeholder conflicts should always be resolved in favor of the customer.

> **NOTE**   We'll talk more about stakeholders and their needs in Chapter 3, "Developing the Project Scope Statement."

Project Characteristics

We've just learned that a project has several characteristics:

- Projects are unique.
- Projects are temporary in nature and have a definite beginning and ending date.
- Projects are completed when the project goals are achieved or it's determined the project is no longer viable.
- A successful project is one that meets or exceeds the expectations of your stakeholders.

Using these criteria, let's examine the assignment from the VP of marketing to determine if it is a project:

Is it unique?   Yes, because the kiosks don't exist in the local grocery stores. This is a new way of offering the company's services to its customer base. While the service the company is offering isn't new, the way it is presenting its services is.

Does the project have a limited time frame?   Yes, the start date of this project is today, and the end date is the end of next year. It is a temporary endeavor.

Is there a way to determine when the project is completed?   Yes, the kiosks will be installed, and services will be offered from them. Once all of the kiosks are intact and operating, the project will come to a close.

Is there a way to determine stakeholder satisfaction?   Yes, the expectations of the stakeholders will be documented in the form of requirements during the planning processes. These requirements will be compared to the finished product to determine if it meets the expectations of the stakeholder.

Houston, we have a project.

What Is Project Management?

You've determined that you indeed have a project. What now? The notes you scratched out on the back of a napkin at coffee break might get you started, but that's not exactly good project management practice.

We have all witnessed this scenario—an assignment is made and the project team members jump directly into the project, busying themselves with building the product or service requested. Often, careful thought is not given to the project-planning process. I'm sure you've heard co-workers toss around statements like "That would be a waste of valuable time" or "Why plan when you can just start building?" Project progress is rarely measured against the customer requirements. In the end, the delivered product or service doesn't meet the expectations of the customer! This is a frustrating experience for all those involved. Unfortunately, many projects follow this poorly constructed path.

Project management brings together a set of tools and techniques—performed by people—to describe, organize, and monitor the work of project activities. *Project managers* are the people responsible for managing the project processes and applying the tools and techniques used to carry out the project activities. All projects are composed of processes, even if they employ a haphazard approach. There are many advantages to organizing projects and teams around the project management processes endorsed by PMI. We'll be examining those processes and their advantages in depth throughout the remainder of this book.

Project management involves applying knowledge, skills, and techniques during the course of the project to accomplish the project requirements. It is the responsibility of the project manager to ensure that project management techniques are applied and followed.

Exam Spotlight

Know the term *project management* as it's described in *A Guide to the PMBOK.*

Project management is a process that includes planning, putting the project plan into action, and measuring progress and performance. It involves identifying the project requirements, establishing project objectives, balancing constraints, and taking the needs and expectations of the key stakeholders into consideration. Planning is one of the most important functions you'll perform during the course of a project. It sets the standard for the rest of the project's life and is used to track future project performance. Before we begin the planning process, let's look at some of the ways the work of project management is organized.

Programs

Programs are groups of related projects that are managed using the same techniques in a coordinated fashion. When projects are managed collectively as programs, they capitalize on benefits that wouldn't be achievable if the projects were managed separately. This would be the case

where a very large program exists with many subprojects under it—for example, building a new shopping mall. Many subprojects exist underneath this program, such as excavation, construction, interior design, store placement, marketing, facilities management, and so on. Each of the subprojects is really a project unto itself. Each subproject has its own project manager, who reports to a project manager with responsibility over several of the areas, who in turn reports to the head project manager over the entire program. All of the projects are related and are managed together so that collective benefits are realized and controls are implemented and managed in a coordinated fashion. Sometimes programs involve aspects of ongoing operations as well. After the shopping mall in our example is built, the management of the facility becomes the ongoing operations part of this program. The management of this collection of projects is called program management. *Program management* involves centrally managing and coordinating groups of related projects to meet the objectives of the program.

Portfolios

Portfolios are collections of programs and projects that meet a specific business goal or objective. Let's say our company is in the construction business. There are several business units within our organization: retail, single family residential, and multifamily residential. All projects and programs associated with the retail business unit belong to the retail portfolio. The program we talked about in the preceding section (the collection of projects associated with building the new shopping mall) is one of the programs that belongs to the retail portfolio. There could be other programs and projects within this portfolio as well. The objective of any program or project in this portfolio is to meet the strategic objectives of the portfolio, which in turn should meet the objectives of the department and ultimately the corporation. *Portfolio management* encompasses managing the collections of programs and projects in the portfolio. This includes weighing the value of each project, or potential project, against the portfolio's strategic objectives. It also concerns monitoring active projects for adherence to objectives, balancing the portfolio among the other investments of the organization, and assuring the efficient use of resources. Portfolio management is generally performed by a senior manager in the organization.

Project Management Offices

The concept of a *project management office,* sometimes referred to as the PMO, has been around for several years. You'll find that many organizations are establishing PMOs in many different forms. PMOs may also be called project offices or program management offices. The PMO is usually a centralized organizational unit that oversees the management of projects and programs throughout the organization. The most common reason a company starts a project management office is to establish and maintain procedures and standards for project management methodologies. In some organizations, project managers and team members might report directly to the PMO and are assigned to projects as they are initiated. In other organizations, the PMO only provides support functions for projects and trains others in project management procedures and techniques. Still others, depending on their size and function, have experts available that assist project managers in project planning, estimating, and business assumption verification tasks. They serve as mentors to junior-level project managers and act as consultants to the senior project managers.

> **NOTE**   A PMO can exist in all organizational structures, functional, matrix, or projec-tized. It may have full authority to oversee projects, including the authority to cancel projects, or it may serve only in an advisory role.

The PMO usually has responsibility for maintaining and archiving project documentation for future reference. This office compares project goals with project progress and gives feedback to the project teams. It also measures the project performance of active projects and suggests corrective actions. The PMO evaluates completed projects for their adherence to the project plan and asks questions like the following: Did the project meet the time frames established, did it stay within budget, and was the quality acceptable?

Project management offices are becoming more common in organizations today, if for no other reason than to serve as a collection point for project documentation. Some PMOs are fairly sophisticated and prescribe the standards and methodologies to be used in all project phases across the enterprise. Still others provide all these functions and also offer project man-agement consulting services. However, the establishment of a PMO is not required in order for you to apply good project management practices to your next project.

Defining Skills Every Good Project Manager Needs

Many times, organizations will knight their technical experts as project managers. The skill and expertise that made them stars in their technical fields are mistakenly thought to translate into project management skills. This is not necessarily so.

Project managers are generalists with many skills in their repertoire. They are also problem solv-ers who wear many hats. Project managers might indeed possess technical skills, but technical skills are not a prerequisite for sound project management skills. Your project team should include a few technical experts, and these are the people whom the project manager will rely on for technical details. Understanding and applying good project management techniques, along with a solid under-standing of general management skills, are career builders for all aspiring project managers.

Project managers have been likened to small-business owners. They need to know a little bit about every aspect of management. General management skills include every area of manage-ment, from accounting to strategic planning, supervision, personnel administration, and more. General management skills are called into play on every project. But some projects require spe-cific skills in certain application areas. Application areas are made up of categories of projects that have common elements. These elements, or application areas, can be defined several ways: by industry group (automotive, pharmaceutical), by department (accounting, marketing), by technical (software development, engineering) or management (procurement, research and development) specialties. These application areas are usually concerned with disciplines, regu-lations, and the specific needs of the project, the customer, or the industry. For example, most

governments have specific procurement rules that apply to their projects that wouldn't be applicable in the construction industry. The pharmaceutical industry is acutely interested in regulations set forth by the Food and Drug Administration, whereas the automotive industry has little or no concern for either of these types of regulations. Having experience in the application area you're working in will give you a leg up when it comes to project management. While you can call in the experts who have application area knowledge, it doesn't hurt for you to understand the specific aspects of the application areas of your project.

The general management skills listed in this section are the foundation of good project management practices. Your mastery of them (or lack thereof) will likely affect project outcomes. The various skills of a project manager can be broken out in a more or less declining scale of importance. We'll look at an overview of these skills now and discuss each in more detail in subsequent chapters.

Communication Skills

One of the single most important characteristics of a first-rate project manager is excellent communication skills. Written and oral communications are the backbone of all successful projects. Many forms of communication will exist during the life of your project. As the creator or manager of most of the project communication (project documents, meeting updates, status reports, etc.), it's your job to ensure that the information is explicit, clear, and complete so that your audience will have no trouble understanding what has been communicated. Once the information has been distributed, it is the responsibility of the person receiving the information to make sure they understand it.

> There are many forms of communication and communication styles. I'll discuss them more in depth in Chapter 8, "Developing the Project Team."

Organizational and Planning Skills

Organizational and planning skills are closely related and probably the most important, after communication skills, a project manager can possess. Organization takes on many forms. As project manager, you'll have project documentation, requirements information, memos, project reports, personnel records, vendor quotes, contracts, and much more to track and be able to locate at a moment's notice. You will also have to organize meetings, put together teams, and perhaps manage and organize media release schedules, depending on your project.

Time management skills are closely related to organizational skills. It's difficult to stay organized without an understanding of how you're managing your time. I recommend you attend a time management class if you've never taken one. They have some great tips and techniques to help you prioritize problems and interruptions, prioritize your day, and manage your time.

Planning is discussed extensively throughout the course of this book. There isn't any aspect of project management that doesn't first involve planning. Planning skills go hand in hand with organizational skills. Combining these two with excellent communication skills is almost a sure guarantee of your success in the project management field.

Budgeting Skills

Project managers establish and manage budgets and therefore need some knowledge of finance and accounting principles. Especially important in this skill area is the ability to perform cost estimates for project budgeting. There are different methods available to determine the project costs. They range from estimating individual activities and rolling the estimates up to estimating the project's cost in one big chunk. These methods will be discussed more fully in later chapters.

After a budget is determined, you can start spending. This sounds more exciting than it actually is. Reading and understanding vendor quotes, preparing or overseeing purchase orders, and reconciling invoices are budgeting skills that will be used by the project manager on most projects. These costs will be linked back to project activities and expense items in the project's budget.

Conflict Management Skills

Show me a project, and I'll show you problems. All projects have some problems, as does, in fact, much of everyday life. Isn't that what they say builds character? But I digress.

Conflict management involves solving problems. Problem solving is really a twofold process. First, you must define the problem by separating the causes from the symptoms. Often when defining problems, you end up just describing the symptoms instead of really getting to the heart of what's causing the problem. To avoid that, ask yourself questions like, "Is it an internal or external problem?" and "Is it a technical problem?" and "Are there interpersonal problems between team members?" and "Is it managerial?" and "What are the potential impacts or consequences?" These kinds of questions will help you to get to the cause of the problem.

Next, after the problem has been defined, you have some decisions to make. It will take a little time to examine and analyze the problem, the situation causing it, and the alternatives available. After this analysis, the project manager will determine the best course of action to take and implement the decision. The timing of the decision is often as important as the decision itself. If you make a good decision but implement it too late, it may turn into a bad decision.

Negotiation and Influencing Skills

Effective problem solving requires negotiation and influencing skills. We all utilize negotiation skills in one form or another every day. For example, on a nightly basis I am asked, "Honey, what do you want for dinner?" Then the negotiations begin, and the fried chicken versus swordfish discussion commences. Simply put, negotiating is working with others to come to an agreement.

Negotiation on projects is necessary in almost every area of the project, from scope definition to budgets, contracts, resource assignments, and more. This may involve one-on-one negotiation or it might involve teams of people, and it can occur many times throughout the project.

Influencing is convincing the other party that swordfish is a better choice than fried chicken, even if fried chicken is what they want. It's also the ability to get things done. Influencing requires an understanding of the formal and informal structure of all the organizations involved in the project.

Power and politics are techniques used to influence people to perform. *Power* is the ability to get people to do things they wouldn't do otherwise. It's also the ability to change minds and the course of events and to influence outcomes.

> **NOTE** We'll discuss power further in Chapter 8.

Politics involve getting groups of people with different interests to cooperate creatively even in the midst of conflict and disorder.

These skills will be utilized in all areas of project management. Start practicing now because, guaranteed, you'll need these skills on your next project.

Leadership Skills

Leaders and *managers* are not synonymous terms. Leaders impart vision, gain consensus for strategic goals, establish direction, and inspire and motivate others. Managers focus on results and are concerned with getting the job done according to the requirements. Even though leaders and managers are not the same, project managers must exhibit the characteristics of both during different times on the project. Understanding when to switch from leadership to management and then back again is a finely tuned and necessary talent.

Team-Building and Motivating Skills

Project managers will rely heavily on team-building and motivational skills. Teams are often formed with people from different parts of the organization. These people may or may not have worked together before, so there may be some component of team-building groundwork that will involve the project manager. The project manager will set the tone for the project team and will help them work through the various team-forming stages to become fully functional. Motivating the team, especially during long projects or those experiencing a lot of bumps along the way, is another important role the project manager fulfills during the course of the project.

An interesting caveat to the team-building role is that project managers many times are responsible for motivating team members who are not their direct reports. This has its own set of challenges and dilemmas. One way to help this situation is to ask the functional manager to allow you to participate in your project team members' performance reviews. Use the negotiation and influencing skills I talked about earlier to make sure you're part of this process.

A Mile Wide and an Inch Deep

Project managers are an interesting bunch. They know a little bit about a lot of things and are excellent communicators. Or, as one person said, they're "a mile wide and an inch deep." They have the ability to motivate people, even those who have no reason to be loyal to the project, and they can make the hard-line calls when necessary. Project managers can get caught in sticky situations that occasionally require making decisions that are good for the company (or the customer) but aren't good for certain stakeholders. These offended stakeholders will then drag their feet, and the project manager has to play the heavy in order to motivate and gain their cooperation again. Some organizations hire contract project managers to run their large, company-altering projects, just because they don't want to burn out a key employee in this role. Fortunately, that doesn't happen often.

Now that you've been properly introduced to some of the skills you need in your tool kit, you'll know to be prepared to communicate, solve problems, lead, and negotiate your way through your next project.

Understanding Organizational Structures

Just as projects are unique, so are the organizations in which they're carried out. Organizations have their own styles and cultures that influence how project work is carried out. One of the keys to determining the type of organization you work in is measuring how much authority senior management is willing to delegate to project managers. While uniqueness abounds in business cultures, all organizations are structured in one of three ways: functional, projectized, or matrix. Variations and combinations exist among these three structures, such as a projectized structure within a functional organization and weak matrix, balanced matrix, and strong matrix organizations.

It pays to know and understand the organizational structure and the culture of the entity you're working with. Companies with aggressive cultures that are comfortable in a leading-edge position within their industry are highly likely to take on risky projects. Project managers who are willing to suggest new ideas and projects that have never been undertaken before are likely to receive a warm reception in this kind of environment. Conversely, organizational cultures that are risk averse and prefer the follow-the-leader position within their industry are highly unlikely to take on risky endeavors. Project managers with risk-seeking, aggressive styles are likely to receive a cool reception in a culture like this.

The level of authority the project manager enjoys is denoted by the organizational structure. For example, a project manager within a functional organization has little to no formal authority. And their title may not be project manager; instead they might be called a project leader, a project coordinator, or perhaps a project expeditor.

Let's take a look at each of these types of organizations individually to better understand how the project management role works in each one.

Functional Organizations

One common type of organization is the *functional organization*. Chances are you have worked in this type of organization. This is probably the oldest style of organization and is therefore known as the traditional approach to organizing businesses.

Functional organizations are centered on specialties and grouped by function, hence the term *functional organization*. As an example, the organization might have a human resources department, finance department, marketing department, etc. The work in these departments is specialized and requires people who have the skill sets and experiences in these specialized functions to perform specific duties for the department. Figure 1.2 shows a typical organizational chart for a functional organization.

F I G U R E   1 . 2   Functional organizational chart
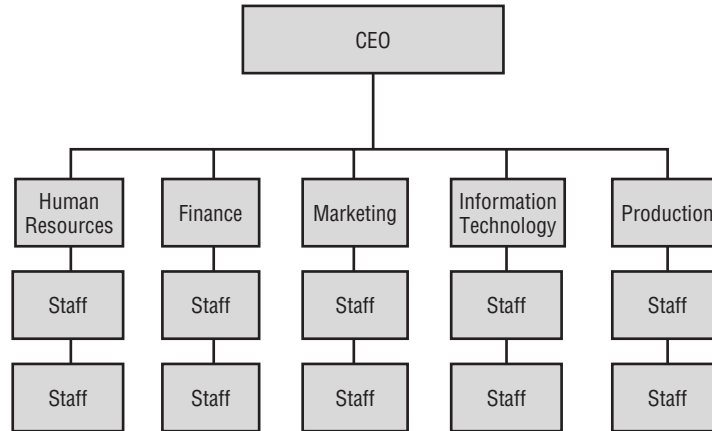
You can see that this type of organization is set up to be a hierarchy. Staff personnel report to managers who report to department heads who report to vice presidents who report to the CEO. In other words, each employee reports to only one manager; ultimately, one person at the top is in charge. Many companies today, as well as governmental agencies, are structured in a hierarchical fashion. In organizations like this, be aware of the chain of command. A strict chain of command may exist, and the corporate culture might dictate that you follow it. Roughly translated: *Don't talk to the big boss without first talking to your boss who talks to their boss who talks to the big boss.* Wise project managers should determine if there is a chain of command, how strictly it's enforced, and how the chain is linked before venturing outside of it.

Each department or group in a functional organization is managed independently and has a limited span of control. Marketing doesn't run the finance department or their projects, for example. The marketing department is concerned with their own functions and projects. If it were necessary for the marketing department to get input from the finance department on a project, the marketing team members would follow the chain of command. A marketing manager would speak to a manager in finance to get the needed information and then pass it back down to the project team.

Human Resources in a Functional Organization

Commonalities exist among the personnel assigned to the various departments in a functional organization. In theory, people with similar skills and experiences are easier to manage as a group. Instead of scattering them throughout the organization, it is more efficient to keep them functioning together. Work assignments are easily distributed to those who are best suited for the task when everyone with the same skill works together. Usually, the supervisors and managers of these workers are experienced in the area they supervise and are able to recommend training and career enrichment activities for their employees.

> **NOTE**   Workers in functional organizations specialize in an area of expertise—finance or personnel administration, for instance—and then become very good at their specialty.

There is a clear upward career path for people in a functional organization. An assistant budget analyst may be promoted to a budget analyst and then eventually to a department manager over many budget analysts.

The Downside of Functional Organizations

Functional organizations have their disadvantages. If this is the kind of organization you work in, you probably have experienced some of them.

One of the greatest disadvantages for the project manager is that they have little to no formal authority. This does not mean that project managers in functional organizations are doomed to failure. Many projects are undertaken and successfully completed within this type of organization. Good communication and interpersonal and influencing skills on the part of the project manager are required to bring about a successful project under this structure.

In a functional organization, the vice president or senior department manager is usually the one responsible for projects. The title of project manager denotes authority, and in a functional structure, that authority rests with the VP.

Managing Projects in a Functional Organization

Projects are typically undertaken in a divided approach in a functional organization. For example, the marketing department will work on their portion of the project and then hand it off to the manufacturing department to complete their part, and so on. The work the marketing department does is considered a marketing project, while the work the manufacturing department does is considered a manufacturing project.

Some projects require project team members from different departments to work together at the same time on various aspects of the project. Project team members in this structure will more than likely remain loyal to their functional manager. The functional manager is responsible for their performance reviews, and their career opportunities lie within the functional department—not within the project team. Exhibiting leadership skills by forming a common vision regarding the project and the ability to motivate people to work toward that vision are great skills to exercise in this situation. As previously mentioned, it also doesn't hurt to have the project manager work with the functional manager in contributing to the employee's performance review.

Resource Pressures in a Functional Organization

Competition for resources and project priorities can become fierce when multiple projects are undertaken within a functional organization. For example, in my organization, it's common to have competing project requests from three or more departments all vying for the same resources. Thrown into the heap is the requirement to make, for example, mandated tax law changes, which automatically usurps all other priorities. This sometimes causes frustration and

political infighting. One department thinks their project is more important than another and will do anything to get that project pushed ahead of the others. Again, it takes great skill and diplomatic abilities to keep projects on track and functioning smoothly. In a later chapter, we'll discuss the importance of gaining stakeholder buy-in and of prioritization and communication distribution to avert some of these problems.

Project managers have little authority in functional organizations, but with the right skills, they can successfully accomplish many projects. Table 1.1 highlights the advantages and disadvantages of this type of organization.
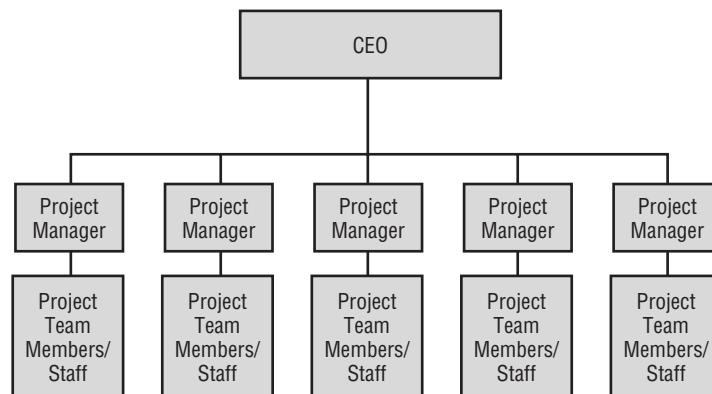
T A B L E   1 . 1   Functional Organizations

Advantages	Disadvantages
Enduring organizational structure.	Project manager has little to no formal authority.
Clear career path with separation of functions, allowing specialty skills to flourish.	Multiple projects compete for limited resources and priority.
Employees have one supervisor with a clear chain of command.	Project team members are loyal to the functional manager.

Projectized Organizations

Projectized organizations are nearly the opposite of functional organizations. The focus of this type of organization is the project itself. The idea behind a projectized organization is to develop loyalty to the project, not to a functional manager.

Figure 1.3 shows a typical org chart for a projectized organization.

F I G U R E   1 . 3   Projectized organizational chart

Organizational resources are dedicated to projects and project work in purely projectized organizations. Project managers almost always have ultimate authority over the project in this structure and report directly to the CEO. In a purely projectized organization, supporting functions like human resources and accounting might report directly to the project manager as well. Project managers are responsible for making decisions regarding the project and acquiring and assigning resources. They have the authority to choose and assign resources from other areas in the organization or to hire them from outside if needed. For example, if there isn't enough money in the budget to hire additional resources, the project manager will have to come up with alternatives to solve this problem. This is known as a constraint. Project managers in all organizational structures are limited by the triple constraints commonly known as: project scope, schedule, and cost (or budget). Quality is sometimes considered a constraint and it's generally affected by scope, schedule, and/or cost. We'll talk more about constraints in Chapter 2, "Creating the Project Charter and Preliminary Scope Statement."

Teams are formed and often *collocated,* which means that team members physically work at the same location. Project team members report to the project manager, not to a functional or departmental manager. One obvious drawback to a projectized organization is that project team members may find themselves out of work at the end of the project. An example of this might be a consultant who works on a project until completion and then is put on the bench or let go at the end of the project. Some inefficiency exists in this kind of organization when it comes to resource utilization. If you have a situation where you need a highly specialized skill at certain times throughout the project, the resource you're using to perform this function might be idle during other times in the project.

In summary, projectized organizations are identified in several ways:

- Project managers have ultimate authority over the project.
- The focus of the organization is the project.
- The organization's resources are focused on projects and project work.
- Team members are collocated.
- Loyalties are formed to the project, not to a functional manager.
- Project teams are dissolved at the conclusion of the project.

Matrix Organizations

Matrix organizations came about to minimize the differences between, and take advantage of, the strengths and weaknesses of functional and projectized organizations. The idea at play here is that the best of both organizational structures can be realized by combining them into one. The project objectives are fulfilled and good project management techniques are utilized while still maintaining a hierarchical structure in the organization.

Employees in a matrix organization report to one functional manager and to at least one project manager. It's possible that employees could report to multiple project managers if they are working on multiple projects at one time. Functional managers pick up the administrative portion of the duties and assign employees to projects. They also monitor the work of their employees on the various projects. Project managers are responsible for executing the project and giving out work assignments based on project activities. Project managers and functional managers share the responsibility of performance reviews for the employee.

Real World Scenario

The Projectized Graphic Artist

You've been appointed project manager for your company's website design and implementation. You're working in a projectized organization, so you have the authority to acquire and assign resources. You put together your team, including programmers, technical writers, testers, and business analysts. Debbie, a highly qualified graphic arts designer, is also part of your team. Debbie's specialized graphic arts skills are needed only at certain times throughout the project. When she has completed the graphic design portion of the screen she's working on, there isn't anything else for her to do until the next page is ready. Depending on how involved the project is and how the work is structured, days or weeks might pass before Debbie's skills are needed. This is where the inefficiency occurs in a purely projectized organization. The project manager will have to find other duties that Debbie can perform during these down times. It's not practical to let her go and then hire her back when she's needed again.

In this situation, you might assign Debbie to other project duties when she's not working on graphic design. Perhaps she can edit the text for the web pages or assist with the design of the upcoming marketing campaign. You might also share Debbie's time with another project manager in the organization.

During the planning process, you will discover the skills and abilities of all your team members so that you can plan their schedules accordingly and eliminate idle time.

> **NOTE** In a nutshell, functional managers assign employees to projects, while project managers assign tasks associated with the project in a matrix organization.

Matrix organizations have unique characteristics. We'll look at how projects are conducted and managed and how project and functional managers share the work in this organizational structure next.

Project Focus in a Matrix Organization

Matrix organizations allow project managers to focus on the project and project work just as in a projectized organization. The project team is free to focus on the project objectives without distractions from the functional department.

Project managers should take care when working up activity and project estimates for the project in a matrix organization. The estimates should be given to the functional managers for input before publishing. The functional manager is the one in charge of assigning or freeing up resources to work on projects. If the project manager is counting on a certain employee to work on the project at a certain time, the project manager should determine their availability up front with the functional manager. Project estimates might have to be modified if it's discovered that the employee they were counting on is not available when needed.
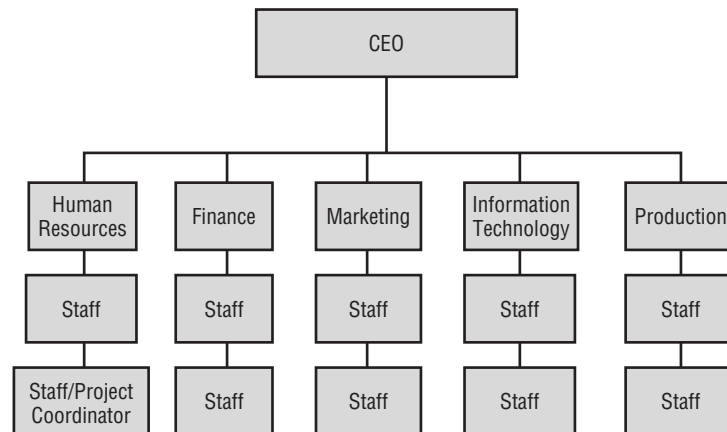
Balance of Power in a Matrix Organization

As we've discussed, a lot of communication and negotiation takes place between the project manager and the functional manager. This calls for a balance of power between the two or one will dominate the other.

In a strong matrix organization, the balance of power rests with the project manager. They have the ability to strong-arm the functional managers into giving up their best resources for projects. Sometimes, more resources than necessary are assembled for the project, and then project managers negotiate these resources among themselves, cutting out the functional manager altogether, as you can see in Figure 1.4.

FIGURE 1.4 Strong matrix organizational chart
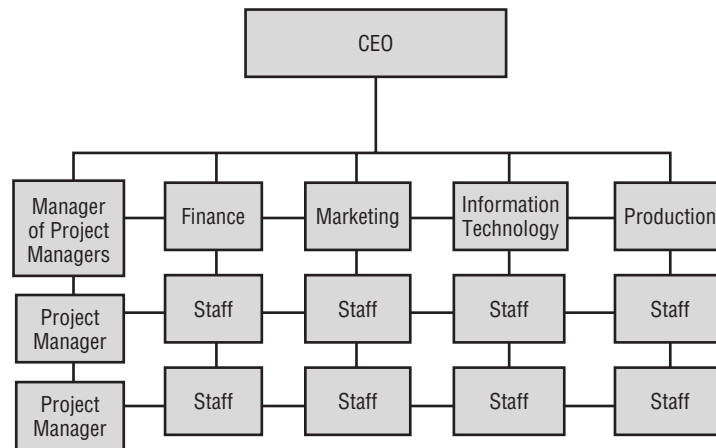
FIGURE 1.5 Weak matrix organizational chart

FIGURE 1.6   Balanced matrix organizational chart
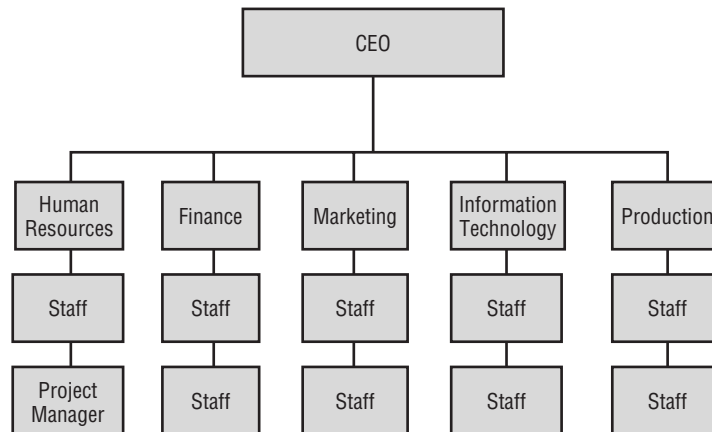
On the other end of the spectrum is the weak matrix (see Figure 1.5). As you would suspect, the functional managers have all the power in this structure. Project managers are really project coordinators or expeditors with part-time responsibilities on projects in a weak matrix organization. Project managers have little to no authority, just as in the functional organization. On the other hand, the functional managers have a lot of authority and make all the work assignments. The project manager simply expedites the project.

In between the weak matrix and the strong matrix is an organizational structure called the *balanced matrix* (see Figure 1.6). The features of the balanced matrix are what we've been discussing throughout this section. The power is balanced between project managers and functional managers. Each manager has responsibility for their parts of the project or organization, and employees get assigned to projects based on the needs of the project, not the strength or weakness of the manager's position.

Matrix organizations have subtle differences, and it's important to understand their differences for the PMP exam. The easiest way to remember them is that the weak matrix has many of the same characteristics as the functional organization, while the strong matrix has many of the same characteristics as the projectized organization. The balanced matrix is exactly that—a balance between weak and strong, where the project manager shares authority and responsibility with the functional manager. Table 1.2 compares all three structures.

Most organizations today use some combination of the organizational structures described here. They're a composite of functional, projectized, and matrix structures. It's rare that an organization would be purely functional or purely projectized. For example, projectized structures can coexist within functional organizations.

In the case of a high-profile, critical project, the functional organization might appoint a special project team to work only on that project. The team is structured outside the bounds of the functional organization and the project manager has ultimate authority for the project. This is a workable project management approach and ensures open communication between the project manager and team members. At the end of the project, the project team is dissolved and the project members return to their functional areas to resume their usual duties.

TABLE 1.2 Comparing Matrix Structures

	Weak Matrix	Balanced Matrix	Strong Matrix
Project Manager's Title:	Project coordinator, project leader, or project expeditor	Project manager	Project manager
Project Manager's Focus:	Split focus between project and functional responsibilities	Projects and project work	Projects and project work
Project Manager's Power:	Minimal authority and power	Balance of authority and power	Full authority and power
Project Manager's Time:	Part-time on projects	Full-time on projects	Full-time on projects
Organization Style:	Most like functional organization	Blend of both weak and strong matrix	Most like a projectized organization
Project Manager Reports to:	Functional manager	A functional manager, but shares authority and power	Manager of project managers

> **Exam Spotlight**
>
> Organizational structure is a topic you may encounter on the exam. Know this topic as it's described in *A Guide to the PMBOK.*

Organizations are unique, as are the projects they undertake. Understanding the organizational structure will help you, as a project manager, with the cultural influences and communication avenues that exist in the organization to gain cooperation and successfully bring your projects to a close.

Understanding Project Life Cycles and Project Management Processes

Project life cycles are similar to the life cycle that parents experience raising their children to adulthood. Children start out as infants and generate lots of excitement wherever they go. However, not much is known about them at first. So you study them as they grow and assess their

needs. Over time, they mature and grow (and cost a lot of money in the process), until one day the parents' job is done.

Projects start out just like this and progress along a similar path. Someone comes up with a great idea for a project and actively solicits support for it. The project, after being approved, progresses through the intermediate phases to the ending phase, where it is completed and closed out.

Project Phases and Project Life Cycles

All projects are divided into phases, and all projects, large or small, have a similar life cycle structure. At a minimum, a project will have a beginning or initiation phase, an intermediate phase or phases, and an ending phase. The number of phases depends on the project complexity and the industry. For example, information technology projects may progress through phases such as requirements, design, program, test, and implement. All the collective phases the project progresses through in concert are called the *project life cycle.*

The end of each phase allows the project manager, stakeholders, and project sponsor the opportunity to determine if the project should continue to the next phase. In order to progress to the next phase, the deliverable from the phase before it must be reviewed for accuracy and approved. As each phase is completed, it's handed off to the next phase. We'll look at handoffs and progressions through these phases next.

Handoffs

Project phases evolve through the life cycle in a series of phase sequences called *handoffs,* or technical transfers. The end of one phase sequence typically marks the beginning of the next. However, the completion of one phase does not automatically signal the beginning of the next phase. For example, in the construction industry, feasibility studies often take place in the beginning phase of a project.

The purpose of the *feasibility study* is to determine if the project is worth undertaking and whether the project will be profitable to the organization. A feasibility study is a preliminary assessment of the viability of the project, the viability or perhaps marketability of the product or service of the project, and the project's value to the organization. It may also determine if the product or service of the project is safe and meets industry or governmental standards and regulations. The completion and approval of the feasibility study triggers the beginning of the requirements phase, where requirements are documented and then handed off to the design phase, where blueprints are produced. The feasibility may also show that the project is not worth pursuing and the project is terminated; thus, the next phase never begins.

Phase Completion

You will recognize phase completion because each phase has a specific *deliverable,* or multiple deliverables, that marks the end of the phase. A deliverable is an output that must be produced, reviewed, and approved to bring the phase or project to completion. Deliverables are tangible and can be measured and easily proved. For instance, a hypothetical deliverable produced in the beginning phase of our construction industry example would be the feasibility study. Deliverables might also include things like design documents, project budgets, blueprints, project schedules,

prototypes, etc. This analysis allows those involved with the opportunity to determine if the project should continue to the next phase. The feasibility study might show that environmental impacts of an enormous nature would result if the construction project were undertaken at the proposed location. Based on this information, a go or no-go decision can be made at the end of this phase. The end of a phase gives the project manager the ability to discover, address, and take corrective action against errors discovered during the phase.

> *A Guide to the PMBOK* states that phase ending reviews are also known by a few other names: phase exits, phase gates, or kill points.

There are times when phases are overlapped to shorten or compress the project schedule. This is called *fast tracking*. Fast tracking means that a later phase is started prior to completing and approving the phase, or phases, that come before it. This technique is used to shorten the overall duration of the project.

Most projects follow phase sequences within a project life cycle and, as a result, have the following characteristics in common: In the beginning phase, which is where the project is initiated, costs are low and there are few team members assigned to the project. As the project progresses, costs and staffing increase and then taper off at the closing phase. The potential that the project will come to a successful ending is lowest at the beginning of the project; its chance for success increases as the project progresses through its phases and life cycle stages. Risk is highest at the beginning of the project and gradually decreases the closer the project comes to completion. Stakeholders have the greatest chance of influencing the project and the characteristics of the product or service of the project in the beginning phases and have less and less influence as the project progresses. This same phenomenon exists within the project management processes as well. We'll look at those next.

Project Management Process Groups

Project management processes organize and describe the work of the project. *A Guide to the PMBOK* describes five process groups used to accomplish this end. These processes are performed by people and, much like project phases, are interrelated and dependent on one another.

A Guide to the PMBOK documents five project management process groups:

- Initiating
- Planning
- Executing
- Monitoring and Controlling
- Closing

All of these process groups have individual processes that collectively make up the group. For example, the Initiating process group has two processes called Develop Project Charter and Develop Preliminary Project Scope Statement. Collectively, these process groups—including all their individual processes—make up the project management process. Projects start with the

Initiating process and progress through all the processes in the Planning process group, the Executing process group, and so on until the project is successfully completed or it's canceled. All projects must complete the Closing processes, even if the project is killed. Phase handoffs (the design phase handoff to manufacturing, for example) also occur within these life cycles.

> Don't confuse project phases and life cycles with the project management process groups. *A Guide to the PMBOK* makes a strong point of this. Project phases and life cycles describe how the work associated with the product of the project will be completed. For example, a construction project may have phases such as feasibility study, design, build, inspection, turnover. The five project management process groups (Initiating, Planning, Executing, Monitoring and Controlling, Closing) organize and describe how the project activities will be conducted in order to meet the project requirements. These processes are generally performed for each phase of a large project. The five process groups are the heart of *A Guide to the PMBOK* and the exam. As you progress through this book, be certain you understand each of these processes as they're described in *A Guide to the PMBOK.*

Let's start with a high-level overview of each process group. The remainder of this book will cover each of these processes in detail. If you want to peek ahead, Appendix A on the CD lists each of the process groups, the individual processes that make up each process group, and the Knowledge Area they belong in. (I'll cover knowledge areas in the section titled "The Project Management Knowledge Areas" later in this chapter.)

Initiating

The *Initiating* process group, as its name implies, occurs at the beginning of the project and at the beginning of each project phase for large projects. Initiating acknowledges that a project, or the next project phase, should begin. This process group grants the approval to commit the organization's resources to working on the project or phase and authorizes the project manager to begin working on the project. The outputs of the Initiating process group, including the project charter and preliminary project scope statement, become inputs into the Planning group.

Planning

The *Planning* process is the process group of formulating and revising project goals and objectives and creating the project management plan that will be used to achieve the goals the project was undertaken to address. The Planning process group also involves determining alternative courses of action and selecting from among the best of those to produce the project's goals. This process group is where the project requirements are fleshed out and stakeholders are identified. Planning has more processes than any of the other project management process groups. The Executing, Monitoring and Controlling, and Closing process groups all rely on the Planning processes and the documentation produced during the Planning processes in order to carry out their functions. Project managers will perform frequent iterations of the Planning processes prior to project completion. Projects are unique and, as such, have never been done before. Therefore, Planning must encompass all areas of project management and consider budgets,

activity definition, scope planning, schedule development, risk identification, staff acquisition, procurement planning, and more. The greatest conflicts a project manger will encounter in this process group are project prioritization issues.

Executing

The *Executing* process group involves putting the project management plan into action. It's here that the project manager will coordinate and direct project resources to meet the objectives of the project plan. The Executing process keeps the project plan on track and ensures that future execution of project plans stays in line with project objectives. This process group is typically where approved changes are implemented. The Executing process group will utilize the most project time and resources, and as a result, costs are usually highest during the Executing process. Project managers will experience the greatest conflicts over schedules in this cycle.

Monitoring and Controlling

The *Monitoring and Controlling* process group is where project performance measurements are taken and analyzed to determine if the project is staying true to the project plan. The idea is to identify problems as soon as possible and apply corrective action to control the work of the project and assure successful outcomes. For example, if you discover that variances exist, you'll apply corrective action to get the project activities realigned with the project plan. This might require additional passes through the Planning processes to adjust project activities, resources, schedules, budgets, and so on.

Closing

The *Closing* process group is probably the most often skipped process group in project management. Closing brings a formal, orderly end to the activities of a project phase or to the project itself. Once the project objectives have been met, most of us are ready to move on to the next project. However, Closing is important because all the project information is gathered now and stored for future reference. The documentation collected during the Closing process group can be reviewed and utilized to avert potential problems on future projects. Contract closeout occurs here, and formal acceptance and approval are obtained from project stakeholders.

Exam Spotlight

The project manager and project team are responsible for determining which processes within each process group are appropriate for the project you're working on. This is called *tailoring.* You should take into consideration the size and complexity of the project and the various inputs and outputs of each of the processes when determining which processes to implement and perform. Small independent projects may not require the rigor of each of the processes within a process group, but every process should be addressed and its level of implementation determined. Use your judgment when deciding which processes to follow, particularly for small projects.

Characteristics of the Process Groups

The progression through the project management process groups exhibit the same characteristics as progression through the project phases do. That is, costs are lowest during the Initiating processes and few team members are involved. Costs and staffing increase in the Executing process group and then decrease as you approach the Closing process group. The chances for success are lowest during Initiating and highest during Closing. The chances for risks occurring are higher during Initiating, Planning, and Executing, but the impacts of risks are greater during the later processes. Stakeholders have the greatest influence during the Initiating and Planning processes and less and less influence as you progress through Executing, Monitoring and Controlling, and Closing. To give you a better idea of when certain characteristics influence a project, refer to Table 1.3 and Table 1.4. A recap of the characteristics in the beginning and ending process groups are shown here.

TABLE 1.3   Characteristics of the Initiating and Planning Process Groups

Low Impact or Probability	High Impact or Probability
Costs	Risk occurrences
Staffing levels	Stakeholder influence
Chance for successful completion	

TABLE 1.4   Characteristics of the Monitoring and Controlling and Closing Process Groups

Low Impact or Probability	High Impact or Probability
Stakeholder influence	Chance for successful completion
Staffing levels	Risk impact
Risk probability	

Remember that costs and resources are usually highest during the Executing phase.

The Process Flow

The five process groups should not be thought of as one-time processes that are performed as discrete elements. Rather, these processes interact and overlap with each other. They are *iterative* and may be revisited and revised throughout the project's life several times as the project is refined. *A Guide to the PMBOK* calls this process of going back through the process groups an *iterative process*. The conclusion of each process group allows the project manager and

stakeholders to re-examine the business needs of the project and determine if the project is sat-
isfying those needs. And it is another opportunity to make a go or no-go decision.

Figure 1.7 shows the five process groups in a typical project. Keep in mind that during phases
of a project, the Closing process group can provide input to the Initiating process group. For
example, once the feasibility study discussed earlier is accepted or closed, it becomes input to the
Initiating process group of the design phase.

FIGURE 1.7   Project management process groups

Project Management Process Groups
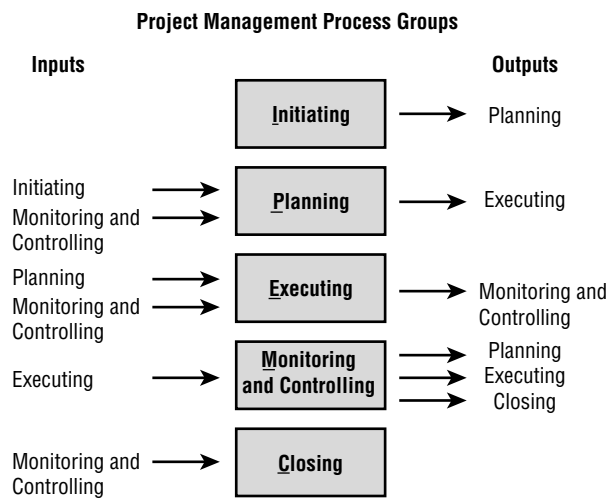
It's important to understand the flow of these processes for the exam. If you remember the pro-
cesses and their inputs and outputs, it will help you when you're trying to decipher an exam ques-
tion. The outputs of one process group become the inputs into the next process group (or the outputs
may be a deliverable of the project). Sometimes just understanding which process the question is ask-
ing about will help you determine the answer. One trick you can use to memorize these processes is
to remember syrup of ipecac. You probably have some of this poison antidote in your medicine cab-
inet at home. If you think of the Monitoring and Controlling process group as simply "Controlling,"
when you sound out the first initial of each of the processes, it sounds like "ipecac"—IPECC (Initi-
ating, Planning, Executing, *Monitoring and* Controlling, and Closing).

As I stated earlier, individual processes make up each of the process groups. For example, the Clos-
ing life cycle process group consists of two processes: Close Project and Contract Closure. Each pro-
cess takes inputs and uses them in conjunction with various tools and techniques to produce outputs.

> **NOTE**   It's outside the scope of this book to explain all the inputs, tools and techniques,
> and outputs for each process in each process group (although each is listed in
> Appendix A on the CD). You'll find each input, tool and technique, and output
> detailed in *A Guide to the PMBOK,* and I highly recommend you get familiar
> with them.

Exam Spotlight

Understand each project management process group and all of the processes that make up these groups. Appendix A on the CD contains a table of all of the process, their inputs, tools and techniques, outputs, and the Knowledge Area they each belong in. (We'll cover knowledge areas in the section titled "The Project Management Knowledge Areas" later in this chapter.)


There are test questions regarding inputs, tools and techniques, and outputs of many of the processes within each process group. One way to keep them all straight is to remember that tools and techniques usually require action of some sort, be it measuring, applying some skill or technique, planning, or using expert judgment. Outputs are usually in the form of a deliverable. Remember that a deliverable is characterized with results or outcomes that can be measured, are tangible, and are provable. Last but not least, outputs from one process sometimes serve as inputs to another process.

Process Interactions

We've covered a lot of material but there's one more concept I want to explain before we move on to the next section. As stated earlier, project managers must determine the processes that are appropriate for effectively managing a project based on the complexity and scope of the project, available resources, budget, and so on. As the project progresses, the project management processes may be revisited and revised to update the project management plan as more information becomes known. Underlying the concept that process groups are iterative is a cycle *A Guide to the PMBOK* describes as the "Plan-Do-Check-Act" cycle that was originally defined by Walter Shewhart and later modified by Edward Deming. The idea behind this concept is that each element in the cycle is results oriented. The results from the Plan cycle become inputs into the Do cycle and so on, much like the way the project management process groups interact. The cycle interactions can be mapped to work in conjunction with the five project management process groups. For example, the Plan cycle maps to the Planning process group. Before we go any further, let's do a brief refresher.

- Project phases describe how the work required to produce the product of the project will be completed

- Project management process groups organize and describe how the project activities will be completed in order to meet the goals of the project

- The Plan-Do-Check-Act cycle is an underlying concept that shows the integrative nature of the process groups

Figure 1.8 shows the relationships and interactions of the concepts we've learned so far. Please bear in mind that a simple figure can't get across all the interactions and iterative nature of these interactions; however, I think you'll see that the figure ties the basic elements of these concepts together.

FIGURE 1.8   Project management process groups
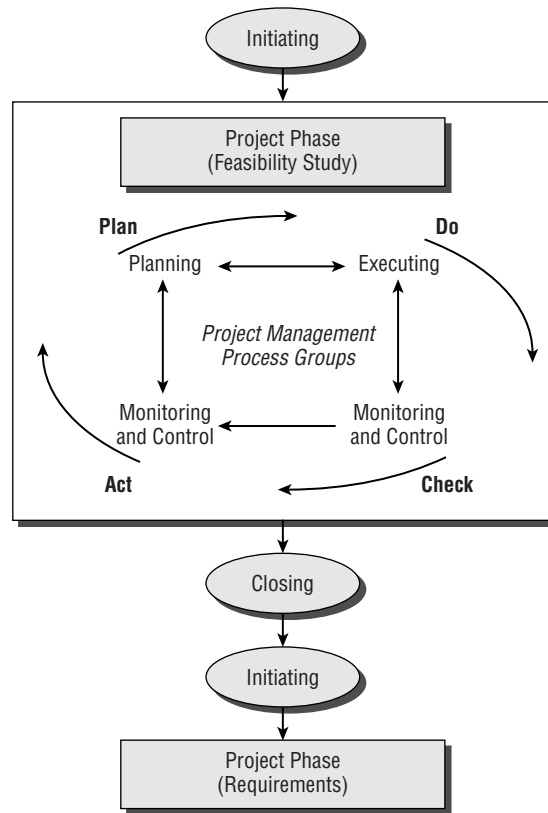
The Project Management Knowledge Areas

There is one more way to classify the processes from each project management process group. *A Guide to the PMBOK* groups these processes into nine categories that they call the *Project Management Knowledge Areas*. These groupings, or knowledge areas, bring together processes that have characteristics in common. For example, the Project Cost Management knowledge area involves all aspects of the budgeting process, as you would suspect. Therefore, processes such as Cost Estimating, Cost Budgeting, and Cost Control belong to this knowledge area. Here's the tricky part—these processes don't belong to the same project management process groups (Cost Estimating and Cost Budgeting are part of the Planning process group and Cost Control is part of the Monitoring and Controlling process group). Think of it this way: knowledge areas bring together processes by commonalities, whereas project management process

groups are more or less the order you perform the project management processes (although remember you can come back through these processes more than once). The nine knowledge areas are as follows:

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resource Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management

Let's take a closer look at each knowledge area so you understand how they relate to the process groups. Included in each of the following subsections is a table that illustrates the processes that make up that knowledge area and the project management process group that each process belongs to. This will help you to see the big picture in terms of process groups compared to knowledge areas. We'll be discussing each of the processes in the various knowledge areas throughout the book, but for now, let's take a high-level look at each of them.

Exam Spotlight

The PMP exam will most likely have a question or two regarding the processes that make up a knowledge area. Remember that knowledge areas bring together processes by commonalities, so thinking about the knowledge area itself should tip you off to the processes that belong to it. Projects are executed in process group order, but the knowledge areas allow a project manager to think about groups of processes that require specific skills. This makes the job of assigning resources easier because team members with specific skills might be able to work on and complete several processes at once. To broaden your understanding of the knowledge areas, cross-reference the purposes and the processes that make up each knowledge area with *A Guide to the PMBOK*.

Project Integration Management

Project Integration Management (see Table 1.5) comprises seven processes:

- Develop Project Charter
- Develop Preliminary Project Scope Statement
- Develop Project Management Plan
- Direct and Manage Project Execution

- Monitor and Control Project Work
- Integrated Change Control
- Close Project

The Project Integration Management knowledge area is concerned with coordinating all aspects of the project plan and is highly interactive. This knowledge area involves identifying and defining the work of the project and combining, unifying, and integrating the appropriate processes. This knowledge area also takes into account satisfactorily meeting the requirements of the customer and stakeholder and managing their expectations.

Project planning, project execution, monitoring project work, and change control occur throughout the project and are repeated continuously while working on the project. Project planning and execution involve weighing the objectives of the project against the alternatives to bring the project to a successful completion. This includes making choices about how to effectively use resources and coordinating the work of the project on a continuous basis. Monitoring the work of the project involves anticipating potential problems and issues and dealing with them before they reach the critical point. Change control impacts the project plan, which in turn impacts the work of the project, which in turn can impact the project management plan, so you can see that these processes are very tightly linked. The processes in this area, as with all the knowledge areas, also interact with other processes in the remaining knowledge areas. For example, the Close Project process uses outputs from the Contract Administration process and produces inputs to the Contract Closure process.

The Project Integration Management knowledge area has two tools for assisting with process integration: Earned Value Management and project management software. Earned Value Management (EVM) is a project-integrating methodology used in this knowledge area to integrate the processes and measure project performance through a project's life cycle. We'll further define EVM and talk more about project management software tools in Chapter 7, "Creating the Project Schedule and Budget."

T A B L E 1 . 5   Project Integration Management

Process Name	Project Management Process Group
Develop Project Charter	Initiating
Develop Preliminary Project Scope Statement	Initiating
Develop Project Management Plan	Planning
Direct and Manage Project Execution	Executing
Monitor and Control Project Work	Monitoring and Controlling
Integrated Change Control	Monitoring and Controlling
Close Project	Closing

Project Scope Management

Project Scope Management (see Table 1.6) has five processes:

- Scope Planning
- Scope Definition
- Create WBS
- Scope Verification
- Scope Control

Project Scope Management is concerned with defining all of the work of the project and only the work needed to successfully meet the project goals. These processes are highly interactive. They define and control what is and what is not part of the project. Each process occurs at least once—and often many times—throughout the project's life.

Project Scope Management encompasses both product scope and project scope. *Product scope* concerns the characteristics of the product or service or result of the project. It's measured against the product requirements to determine successful completion or fulfillment. The application area usually dictates the process tools and techniques you'll use to define and manage product scope. *Project scope* involves managing the work of the project and only the work of the project. Project scope is measured against the project management plan, the project scope statement, the work breakdown structure (WBS) and the WBS dictionary.

> **NOTE**   To ensure a successful project, both product and project scope must be well integrated. This implies that Project Scope Management is well integrated with the other knowledge area processes.

Scope Planning, Scope Definition, Create WBS, Scope Verification, and Scope Control involve the following:

- Detailing the requirements of the product of the project
- Verifying those details using measurement techniques
- Creating a project scope management plan
- Creating a work breakdown structure
- Controlling changes to these processes

T A B L E   1 . 6   Project Scope Management

Process Name	Project Management Process Group
Scope Planning	Planning
Scope Definition	Planning
Create WBS	Planning

T A B L E 1 . 6   Project Scope Management *(continued)*

Process Name	Project Management Process Group
Scope Verification	Monitoring and Controlling
Scope Control	Monitoring and Controlling

Project Time Management

The *Project Time Management* knowledge area, shown in Table 1.7, has six processes:

- Activity Definition
- Activity Sequencing
- Activity Resource Estimating
- Activity Duration Estimating
- Schedule Development
- Schedule Control

This knowledge area is concerned with estimating the duration of the project plan activities, devising a project schedule, and monitoring and controlling deviations from the schedule. Collectively, this knowledge area deals with completing the project in a timely manner. Time management is an important aspect of project management because it concerns keeping the project activities on track and monitoring those activities against the project plan to ensure that the project is completed on time.

While each process in this knowledge area occurs at least once in every project (and sometimes more), in many cases, particularly on small projects, Activity Sequencing, Activity Duration Estimating, and Schedule Development are completed as one activity. Only one person is needed to complete these processes for small projects, and they're all worked on at the same time.

T A B L E 1 . 7   Project Time Management

Process Name	Project Management Process Group
Activity Definition	Planning
Activity Sequencing	Planning
Activity Resource Estimating	Planning
Activity Duration Estimating	Planning
Schedule Development	Planning
Schedule Control	Monitoring and Controlling

Project Cost Management

As its name implies, the *Project Cost Management* knowledge area centers around costs and budgets. The processes that make up this knowledge area are as follows:

- Cost Estimating
- Cost Budgeting
- Cost Control

You can see how they work together in Table 1.8.

The activities in the Project Cost Management knowledge area establish cost estimates for resources, establish budgets, and keep watch over those costs to ensure that the project stays within the approved budget. This knowledge area is primarily concerned with the costs of resources, but other costs should be considered as well. For example, make certain to examine ongoing maintenance and support costs for software you're considering for the project.

Depending on the complexity of the project, these processes might need the involvement of more than one person. For example, the finance person might not have expertise about the resources documented in the staffing management plan so the project manager will need to bring in a staff member with those skills to assist with the activities in this process.

Two techniques are used in this knowledge area to decide among alternatives and improve the project process: life-cycle costing and Value Engineering. The life-cycle costing technique considers a group of costs collectively (such as acquisition, operations, disposal, and so on) when deciding among or comparing alternatives. The Value Engineering technique helps improve project schedules, profits, quality, and resource usage and optimizes life-cycle costs, among others. These techniques can improve decision making, reduce costs, reduce activity durations, and improve the quality of the deliverables. Some application areas require additional financial analysis to help predict project performance. Techniques such as payback analysis, return on investment, and discounted cash flows are a few of the tools used to accomplish this.

> **NOTE**   We'll discuss these techniques and others in further detail in Chapter 2.

T A B L E   1 . 8   Project Cost Management

Process Name	Project Management Process Group
Cost Estimating	Planning
Cost Budgeting	Planning
Cost Control	Monitoring and Controlling

Project Quality Management

The *Project Quality Management* knowledge area assures that the project meets the require-
ments that it was undertaken to produce. This knowledge area focuses on product quality as
well as on the quality of the project management process used during the project. These pro-
cesses measure overall performance and monitor project results and compare them to the qual-
ity standards set out in the project-planning process to assure the customer will receive the
product or service they commissioned.

As you can see from Table 1.9, Project Quality Management is composed of the following
three processes: Quality Planning, Perform Quality Assurance, and Perform Quality Control.

T A B L E   1 . 9   Project Quality Management

Process Name	Project Management Process Group
Quality Planning	Planning
Perform Quality Assurance	Executing
Perform Quality Control	Monitoring and Controlling

Project Human Resource Management

Project Human Resource Management involves all aspects of people management and personal
interaction, including leading, coaching, dealing with conflict, performance appraisals, and
more. These processes ensure that the human resources assigned to the project are used in the
most effective way possible. Some of the project participants whom you'll get to practice these
skills on include stakeholders, team members, and customers. Each requires the use of different
communication styles, leadership skills, and team-building skills. A good project manager
knows when to enact certain skills and communication styles based on the situation.

Projects are unique and temporary and so usually are project teams. Teams are put together based
on the skills and resources needed to complete the activities of the project, and many times project
team members may not know one another. Because the makeup of each team is different and the
stakeholders involved in the various stages of the project may change, you'll use different techniques
at different times throughout the project to manage the processes in this knowledge area.

The Project Human Resource Management knowledge area contains the following processes:

▪   Human Resources Planning

▪   Acquire Project Team

▪   Develop Project Team

▪   Manage Project Team

Take a look at Table 1.10 to see a visual overview of Project Human Resource Management.

T A B L E   1 . 1 0   Project Human Resource Management

Process Name	Project Management Process Group
Human Resource Planning	Planning
Acquire Project Team	Executing
Develop Project Team	Executing
Manage Project Team	Monitoring and Controlling

Project Communications Management

The following processes make up the *Project Communications Management* knowledge area:

- Communications Planning
- Information Distribution
- Performance Reporting
- Manage Stakeholders

The processes in the Project Communications Management knowledge area are related to general communication skills, but they encompass much more than an exchange of information. Communication skills are considered general management skills that the project manager utilizes on a daily basis. The processes in the Process Communications Management knowledge area seek to ensure that all project information—including project plans, risk assessments, meeting notes, and more—is collected, documented, archived, and disposed of at the proper time. These processes also ensure that information is distributed and shared with stakeholders, management, and project members at appropriate times. When the project is closed, the information is archived and used as a reference for future projects. This is referred to as *historical information* in several project processes.

Everyone on the project has some involvement with this knowledge area because all project members will send and/or receive project communication throughout the life of the project. It is important that all team members and stakeholders understand how communication affects the project.

Table 1.11 shows the Project Communications Management process in progress.

T A B L E   1 . 1 1   Project Communication Management

Process Name	Project Management Process Group
Communications Planning	Planning
Information Distribution	Executing

T A B L E   1 . 1 1   Project Communication Management *(continued)*

Process Name	Project Management Process Group
Performance Reporting	Monitoring and Controlling
Manage Stakeholders	Monitoring and Controlling

Project Risk Management

Project Risk Management, as seen in Table 1.12, contains six processes:

- Risk Management Planning
- Risk Identification
- Qualitative Risk Analysis
- Quantitative Risk Analysis
- Risk Response Planning
- Risk Monitoring and Control

Risks include both threats to and opportunities within the project. The processes in this knowledge area are concerned with identifying, analyzing, and planning for potential risks, both positive and negative, that may impact the project. This means minimizing the probability and impact of negative risks while maximizing the probability and impact of positive risks. These processes are also used to identify the positive consequences of risk and exploit them to improve project objectives or discover efficiencies that may improve project performance.

Organizations will often combine several of these processes into one step. For example, Risk Identification, Qualitative Risk Analysis, and Quantitative Risk Analysis might be performed at the same time. The important thing about the Project Risk Management knowledge area is that you should strive to identify all the risks and develop responses for those with the greatest consequences to the project objectives.

T A B L E   1 . 1 2   Project Risk Management

Process Name	Project Management Process Group
Risk Management Planning	Planning
Risk Identification	Planning
Qualitative Risk Analysis	Planning
Quantitative Risk Analysis	Planning

T A B L E   1 . 1 2   Project Risk Management *(continued)*

Process Name	Project Management Process Group
Risk Response Planning	Planning
Risk Monitoring and Control	Monitoring and Controlling

Project Procurement Management

The *Project Procurement Management* knowledge area includes the processes involved with purchasing goods or services from vendors, contractors, suppliers, and others outside the project team. When discussing the Project Procurement Management processes, it's assumed that the discussion is taking place from your perspective as a buyer while sellers are external to the project team. Interestingly, the seller may manage their work as a project, particularly when the work is performed on contract, and you as the buyer become a key stakeholder in their project.

The processes in the Project Procurement Management knowledge area, shown in Table 1.13, are as follows:

- Plan Purchases and Acquisitions
- Plan Contracting
- Request Seller Responses
- Select Sellers
- Contract Administration
- Contract Closure

T A B L E   1 . 1 3   Project Procurement Management

Process Name	Project Management Process Group
Plan Purchases and Acquisitions	Planning
Plan Contracting	Planning
Request Seller Reponses	Executing
Select Sellers	Executing
Contract Administration	Monitoring and Controlling
Contract Closure	Closing

The remainder of this book will deal with processes and process groups as they occur in order (i.e., Initiating, Planning, Executing, Monitoring and Controlling, and Closing), as this is the way you will encounter and manage them during a project.

Summary

Phew! We covered a lot of ground in this chapter. We learned that projects exist to bring about a unique product, service, or result. Projects are temporary in nature and have definite beginning and ending dates.

Stakeholders are those people or organizations that have a vested interest in the outcome of the project. Stakeholders include people like the project sponsor, the customer, key management personnel, the project manager, contractors, suppliers, and more. Projects are considered complete when the project meets or exceeds the expectations of the stakeholders.

Project management is a discipline that brings together a set of tools and techniques to describe, organize, and monitor the work of project activities. Project managers are the ones responsible for carrying out these activities. Projects may be organized into programs or portfolios and may be managed centrally by a PMO.

Project managers have a wide variety of skills. Not only should they be versed in the field they're working in, but in general management skills as well. Communication is the most important skill a project manager will use in the course of a project.

Organizational structures come in variations of three forms: functional, projectized, and matrix organizations. Functional organizations are traditional with hierarchical reporting structures. Project managers have little to no authority in this organization. Projectized organizations are structured around project work, and staff personnel report to project managers. Project managers have full authority in this organizational structure. Matrix organizations are a combination of the functional and projectized. A project manager's authority varies depending on the structure of the matrix, be it a weak matrix, a balanced matrix, or a strong matrix.

Projects progress through phases along a life cycle path to complete the product of the project. The project management process groups are performed throughout the project's life cycle. The process groups described in *A Guide to the PMBOK* are Initiating, Planning, Executing, Monitoring and Controlling, and Closing. Additionally, there are nine knowledge areas that bring together processes that have characteristics in common.

Exam Essentials

Be able to describe the difference between projects and operations.   A project is temporary in nature with a definite beginning and ending date. Projects produce unique products, services, or results. Operations are ongoing and use repetitive processes that typically produce the same result over and over.

Be able to denote some of the skills every good project manager should possess.   Communication, budgeting, organizational, problem solving, negotiation and influencing, leading, and team building are skills a project manager should possess.

Be able to differentiate the different organizational structures and the project manager's authority in each.   Organizations are usually structured in some combination of the following: functional, projectized, and matrix (including weak matrix, balanced matrix, and strong matrix). Project managers have the most authority in a projectized organization and the least amount of authority in a functional organization.

Be able to name the five project management processes.   The five project management processes are Initiating, Planning, Executing, Monitoring and Controlling, and Closing.

Be able to name the nine Project Management Knowledge Areas.   The nine Project Management Knowledge Areas are Project Integration Management, Project Scope Management, Project Time Management, Project Cost Management, Project Quality Management, Project Human Resource Management, Project Communications Management, Project Risk Management, and Project Procurement Management.
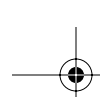
Key Terms

You've learned a lot of new key words in this chapter. PMI has worked hard to develop and define standard project management terms that apply across industries. Here is a list of some of the terms you came across in this chapter:

balanced matrix	program management
Closing	programs
Collocated	progressive elaboration
Deliverable	Project Communications Management
Executing	Project Cost Management
fast tracking	Project Human Resource Management
feasibility study	Project Integration Management
functional organization	project life cycle
Handoffs	project management
historical information	Project Management Knowledge Areas
Initiating	project management office
Iterative	project managers
Leaders	Project Procurement Management
Managers	Project Quality Management
matrix organizations	Project Risk Management
Monitoring and Controlling	project scope
Operations	Project Scope Management
Planning	project sponsor
Politics	Project Time Management
portfolio management	projectized organizations
Portfolios	projects
Power	stakeholders
product scope	tailoring

Review Questions

1. Which organization has set the de facto standards for project management techniques?

    A. PMBOK

    B. PMO

    C. PMI

    D. PMA

2. The VP of marketing approaches you and requests that you change the visitor logon screen on the company's website to include a username with at least six characters. This is considered _____.

    A. Project initiation

    B. Ongoing operations

    C. A project

    D. Project execution

3. Your company manufactures small kitchen appliances. They are introducing a new product line of appliances in designer colors with distinctive features for kitchens in small spaces. These new products will be offered indefinitely starting with the spring catalog release. Which of the following is true?

    A. This is a project because this new product line has never been manufactured and sold by this company before.

    B. This is an ongoing operation because the company is in the business of manufacturing kitchen appliances. Introducing designer colors and features is simply a new twist on an existing process.

    C. This is an ongoing operation because the new product line will be sold indefinitely. It's not temporary.

    D. This is not a project or an ongoing operation. This is a new product introduction not affecting ongoing operations.

4. Your company manufactures small kitchen appliances. It is introducing a new product line of appliances in designer colors with distinctive features for kitchens in small spaces. These new products will be offered indefinitely starting with the spring catalog release. In order to determine the characteristics and features of the new product line, you will have to perform which of the following?

    A. Fast tracking

    B. Consulting with the stakeholders

    C. Planning the project life cycle

    D. Progressive elaboration

5. A project is considered successful when _____.

   A. The product of the project has been manufactured.

   B. The project sponsor announces the completion of the project.

   C. The product of the project is turned over to the operations area to handle the ongoing aspects of the project.

   D. The project meets or exceeds the expectations of the stakeholders.

6. The VP of customer service has expressed concern over a project you're involved in. His specific concern is that if the project is implemented as planned, he'll have to purchase additional equipment to staff his customer service center. The cost is substantial and was not taken into consideration in the project budget. The project sponsor insists that the project must go forward as originally planned or the customer will suffer. Which of the following is true?

   A. The VP of customer service is correct. Since the cost was not taken into account at the beginning of the project, the project should not go forward as planned. Project initiation should be revisited to examine the project plan and determine how changes can be made to accommodate customer service.

   B. The conflict should be resolved in favor of the customer.

   C. The conflict should be resolved in favor of the project sponsor.

   D. The conflict should be resolved in favor of the VP of customer service.

7. Which of the following brings together a set of tools and techniques used to describe, organize, and monitor the work of project activities?

   A. Project managers

   B. *A Guide to the PMBOK*

   C. Project management

   D. Stakeholders

8. The Project Integration Management knowledge area is made up of which of the following processes?

   A. Initiation, Project Plan Development, and Integrated Change Control

   B. Project Plan Development, Project Plan Execution, and Integrated Change Control

   C. Project Plan Development, Initiation, and Scope Planning

   D. Initiation, Scope Planning, and Integrated Change Control

9. You are the project manager for Fun Days vacation packages. Your new project assignment is to head up the Fun Days resort opening in Austin, Texas. You are estimating the duration of the project plan activities, devising the project schedule, and monitoring and controlling deviations from the schedule. Which of the Project Management Knowledge Areas are you working in?

   A. Project Scope Management

   B. Project Quality Management

   C. Project Integration Management

   D. Project Time Management

10. You are the project manager for a large construction project. The project objective is to construct a set of outbuildings to house the Olympic support team that will be arriving in your city 18 months from the project start date. Resources are not readily available as they are currently assigned to other projects. Jack, an expert crane operator, is needed for this project two months from today. Which of the following skills will you use to get Jack assigned to your project?

A. Negotiation and influencing skills

B. Communication and organizational skills

C. Communication skills

D. Problem-solving skills

11. You've decided to try your hand at project management in the entertainment industry. You're working on a movie production and the team has just completed the storyboard phase of the project. Which of the following is true?

A. The storyboard is a deliverable that marks the end of the phase. The deliverable must be approved before the next phase begins.

B. The storyboard phase marks the end of the Initiating process group and the next phase of the project should begin.

C. All of the phases of this project together make up a program.

D. The division of phases and determining which processes to use in each phase is called tailoring.

12. You are managing a project to install a new postage software system that will automatically print labels and administer postage for certified mailings, overnight packages, and other special mailing needs. You've attempted to gain the cooperation of the business analyst working on this project and need some answers. She is elusive and tells you that this project is not her top priority. What should you do to avoid situations like this in the future?

A. Establish the business analyst's duties well ahead of due dates and tell her you'll be reporting on her performance to her functional manager.

B. Establish the business analyst's duties well ahead of due dates and tell her you are expecting her to meet these expectations because the customer is counting on the project meeting due dates to save significant costs on their annual mailings.

C. Negotiate with the business analyst's functional manager during the planning process to establish expectations and request to participate in the business analyst's annual performance review.

D. Negotiate with the business analyst's functional manager during the planning process to establish expectations and inform the functional manager of the requirements of the project. Agreement from the functional manager will assure the cooperation of the business analyst.

13. The amount of authority a project manager possesses can be related to _____.

A. The project manager's communication skills

B. The organizational structure

C. The amount of authority the manager of the project manager possesses

D. Key stakeholder's influence on the project

14. What is one of the advantages of a functional organization?

    A. All employees report to one manager and have a clear chain of command.

    B. All employees report to two or more managers, but project team members show loyalty to functional managers.

    C. The organization is focused on projects and project work.

    D. Teams are collocated.

15. You have been assigned to a project in which the objectives are to direct customer calls to an interactive voice response system before being connected to a live agent. You are in charge of the media communications for this project. You report to the project manager in charge of this project and the VP of marketing, who share responsibility for this project. Which organizational structure do you work in?

    A. Functional organization

    B. Weak matrix organization

    C. Projectized organization

    D. Balanced matrix organization

16. You have been assigned to a project in which the objectives are to expand three miles of the north-south highway through your city by two lanes in each direction. You are in charge of the demolition phase of this project, and you report to the project manager in charge of this project. You have been hired on contract and will be released at the completion of the demolition phase. What type of organizational structure does this represent?

    A. Functional organization

    B. Weak matrix organization

    C. Projectized organization

    D. Balanced matrix organization

17. What are the five project management process groups, in order?

    A. Initiating, Executing, Planning, Monitoring and Controlling, and Closing

    B. Initiating, Monitoring and Controlling, Planning, Executing, and Closing

    C. Initiating, Planning, Monitoring and Controlling, Executing, and Closing

    D. Initiating, Planning, Executing, Monitoring and Controlling, and Closing

18. You have been assigned to a project in which the objectives are to expand three miles of the north-south highway through your city by two lanes in each direction. You are interested in implementing a new project process called Design-Build in order to speed up the project schedule. The idea is that the construction team will work on the first mile of the highway reconstruction at the same time the design team is coming up with plans for the third mile of the reconstruction rather than completing all design before any construction begins. This is an example of _____.

    A. Managing the projects as a program

    B. Fast tracking

    C. Progressive elaboration

    D. Collocation

19. During which project management process are risk and stakeholder's ability to influence project outcomes the highest at the beginning of the process?

    A. Planning

    B. Executing

    C. Initiating

    D. Monitoring and Controlling

20. You are a project manager working on gathering requirements and establishing estimates for the project. Which process group are you in?

    A. Planning

    B. Executing

    C. Initiating

    D. Monitoring and Controlling

Answers to Review Questions

1.   C. The Project Management Institute (PMI) is the industry-recognized standard for project management practices.

2.   B. Projects exist to create a unique product or service. The logon screen in this question is not a unique product. A minor change has been requested, indicating this is an ongoing operation function. Some of the criteria for projects are that they are unique, temporary with definitive start and end dates, and considered complete when the project goals are achieved.

3.   A. This is a project. The product line is new, which implies that this is a unique product—it hasn't been done before. We can discern a definite start and end date by the fact that the new appliances must be ready by the spring catalog release.

4.   D. Progressive elaboration is the process of determining the characteristics and features of the product of the project. Progressive elaboration is carried out in steps in detailed fashion.

5.   D. A project is considered successful when stakeholder needs and expectations are met or exceeded.

6.   B. Conflicts between stakeholders should always be resolved in favor of the customer. This question emphasizes the importance of identifying your stakeholders and their needs as early as possible in the project. We'll discuss this more in later chapters.

7.   C. Project management brings together a set of tools and techniques to organize project activities. Project managers are the ones responsible for managing the project processes.

8.   B. Project Integration Management is made up of Project Plan Development, Project Plan Execution, and Integrated Change Control.

9.   D. Project Time Management involves the following processes: Activity Definition, Activity Sequencing, Activity Duration Estimating, Schedule Development, and Schedule Control.

10.   A. Negotiation and influencing skills are needed to convince Jack's boss and come to agreement concerning his assignment.

11.   A. The storyboard is a deliverable. Phase endings are characterized by the completion, review, and approval of the deliverable. The next phase should not begin until the deliverable is approved.

12.   C. Negotiate with the functional manager to participate in the business analyst's annual performance review.

13.   B. The level of authority the project manager has is determined by the organizational structure. For instance, in a functional organization, the project manager has little to no authority, but in a projectized structure, the project manager has full authority.

14.   A. An advantage for employees in a functional organization is that they have only one supervisor and a clear chain of command exists.

15. D. Employees in a balanced matrix often report to two or more managers. Functional managers and project managers share authority and responsibility for projects. There is a balance of power between the functional managers and project managers.

16. C. Projectized organizations are focused on the project itself. One issue with this type of structure is determining what to do with project team members when they are not actively involved on the project. One alternative is to release them when they are no longer needed.

17. D. Remember the acronym that sounds like syrup of ipecac: IPECC (Initiating, Planning, Executing, Monitoring and Controlling, and Closing).

18. B. Fast tracking is starting a new phase before the phase you're working on is completed. This compresses the project schedule, and as a result, the project is completed sooner.

19. C. The Initiating process is where stakeholders have the greatest ability to influence outcomes of the project. Risk is highest during this stage because of the high degree of unknown factors.

20. A. The Planning process is where requirements are fleshed out, stakeholders are identified, and estimates on project costs and time are made.