# Chapter



**Initiating the Project** 

#### ✓ 1.1 Summarize the properties of a project.

- Temporary
- Start and finish
- Unique
- Reason/purpose
- Project as part of a program
- Project as part of a portfolio
- ✓ 1.5 Identify common project team organizational structures.
  - Functional
    - Resources reporting to functional manager
    - Project manager has limited or no authority.
  - Matrix
    - Authority is shared between functional managers and project managers.
    - Resources assigned from Functional area to project
    - Project manager authority ranges from weak to strong.
    - Projectized
    - Project manager has full authority.
    - Resources report to project manager.
    - Ad hoc resources



Your decision to take the CompTIA Project+ exam is an important step in your career aspirations. Certification is important for project managers because many employers look

for project management certification in addition to real-life experience and evidence of formal education from job applicants. This book is designed to provide you with the necessary concepts to prepare for the Project+ exam. Much of the information here will be based on the Knowledge Areas documented in A Guide to the Project Management Body of Knowledge (PMBOK Guide<sup>®</sup>) published by the Project Management Institute (PMI<sup>®</sup>). The book will include tips on how to prepare for the exam, as well as examples and real-world scenarios to illustrate the concepts.

This chapter will cover the definitions and characteristics of a project, provide a highlevel overview of project management, describe the difference between a program and a portfolio, and explain how organizations are structured.

# **Defining the Project**

Projects exist to bring about or fulfill the goals of the organization. Most projects benefit from the application of a set of processes and standards known as *project management*. Let's start with some fundamental questions.

- What makes a new assignment a project?
- How do you know if you are working on a project?
- What distinguishes a project from an operational activity?

Projects involve a team of people, and so do day-to-day business activities. They both involve following a process or a plan, and they both result in activities that help reach a goal. So, what is so different about a project? Let's explore all of these questions in the following sections.

#### **Identifying the Project**

A *project* is a temporary endeavor that has definite beginning and ending dates, and it results in a unique product, service, or result. A project is considered a success when the goals it sets out to accomplish are fulfilled and the stakeholders are satisfied with the results.

Projects also bring about a product, service, or result that never existed before. This may include creating tangible goods, implementing software, writing a book, planning and

executing an employee appreciation event, constructing a building, and more. There is no limit to what can be considered a project as long as it fits the following criteria:

**Unique** A project is typically undertaken to meet a specific business objective. It involves doing something new, which means that the end result should be a unique product or service. These products may be marketed to others, may be used internally, may provide support for ongoing operations, and so on.

**Temporary** Projects have definite start and end dates. The time it takes to complete the work of the project can vary in overall length from a few weeks to several years, but there is always a start date and an end date.

**Reason or Purpose** A project comes about to fulfill a purpose. This might include introducing a new product, fulfilling a business objective or strategic goal, satisfying a social need, and any number of other reasons. It's important to document and communicate the purpose and reasons for the project so that team members remain focused on achieving the goals of the project.

**Stakeholder Satisfaction** A project starts once it's been identified, the objectives have been outlined in the project charter, and appropriate stakeholders have approved the project plan. A project ends when those goals have been met to the satisfaction of the stakeholders.

Once you've identified the project, you'll validate the project (we'll cover this topic in the section "Validating the Project" later in this chapter) and then write the project charter and obtain approval for the charter. We'll talk in more detail about the project charter in Chapter 3, "Creating the Project Charter."

#### **Programs and Portfolios**

Projects are sometimes managed as part of a program or portfolio. A *program* is a group of related projects that are managed together using coordinated processes and techniques. The collective management of a group of projects can bring about benefits that wouldn't be achievable if the projects were managed separately.

*Portfolios* are collections of programs, subportfolios, and projects that support strategic business goals or objectives. Unlike programs, portfolios may consist of projects that are not related.

Here's an example to help clarify the difference between programs and portfolios. Let's say your company is in the construction business. The organization has several business units: retail construction, single-family residential buildings, and multifamily residential buildings. Individually, each of the business units may comprise a program. For example, retail construction is a program because all the projects within this program exist to create new retail-oriented buildings. This is not the same as single-family home construction (a different program), which is not the same as multifamily residential construction (a different program). Collectively, the programs and projects within all of these business units make up the portfolio. Other projects and programs may exist within this portfolio as well, such as parking structures, landscaping, and so on.

Programs and projects within a portfolio are not necessarily related to one another in a direct way. And projects may independently exist within the portfolio (in other words, the project isn't related to a program but belongs to the portfolio). However, the overall objective of any program or project in a portfolio is to meet the strategic objectives of the portfolio, which in turn should meet the strategic objectives of the business unit or corporation.

#### **Understanding Operations**

*Operations* are ongoing and repetitive. They don't have a beginning date or an ending date, unless you're starting a new operation or retiring an old one. Operations typically involve ongoing functions that support the production of goods or services. Projects, on the other hand, come about to meet a specific, unique result and then conclude.

It's important to understand that projects and operations go hand in hand in many cases. For example, perhaps you've been assigned to research and implement state-of-theart equipment for a shoe manufacturing plant. Once the implementation of the equipment is complete, the project is concluded. A handoff to the operations team occurs, and the everyday tasks the equipment performs become an ongoing operation.



Don't be confused by the term *service* regarding the definition of a project. Providing janitorial services on a contract is operations; providing contract Java programmers for 18 months to work on an IT project is a project.

Let's look at the definition of two more terms. *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* (PMs) are the people responsible for applying these tools to the various project activities. Their primary purpose is to integrate all the components of the project and bring it to a successful conclusion. Managing a project involves many skills, including dealing with competing needs for your resources, obtaining adequate budget dollars, identifying risks, managing to the project requirements, interacting with stakeholders, staying on schedule, and ensuring a quality product.

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We'll spend the remainder of this book describing the tools and techniques you'll use to accomplish the goals of the project, including the key concepts you'll need to know for the exam. Many of the standards surrounding these techniques are documented in the *PMBOK Guide*<sup>®</sup>.

#### Using the PMBOK Guide®

Project management standards are documented in *A Guide to the Project Management Body of Knowledge (PMBOK Guide®)*, published by the Project Management Institute. PMI<sup>®</sup> sets the global de facto standard in project management. It's a large organization with more than 700,000 members from countries around the globe. In addition to publishing the *PMBOK Guide*<sup>®</sup>, PMI<sup>®</sup> also manages two rigorous certification exams for individual project managers: the Certified Associate in Project Management (CAPM)<sup>®</sup> and the Project Management Professional (PMP)<sup>®</sup>. The *PMBOK Guide*<sup>®</sup> is the basis for the exam portion of the CAPM and PMP certifications. If you continue in a career in project management, you may decide to study and sit for the CAPM or PMP certification exams. The material you will study to prepare for the Project+ exam is an excellent foundation on which to build your project management knowledge.

# **Understanding Organizational Structures**

The structure of your organization has an impact on many aspects of project management, including the authority of the project manager and the process to assign resources.

Project managers are often frustrated by what appear to be roadblocks in moving the project forward, but in many cases, the root issue is the organizational structure itself and how it operates. The following sections will cover the different types of organizational structures and how they influence the way projects are conducted.

#### **The Functional Organization**

The classic organizational structure is the *functional organization*, as shown in Figure 1.1. In this structure, the staff is organized along departmental lines, such as IT, marketing, sales, network, human resources, public relations, customer support, and legal. Each department is managed independently with a limited span of control. This organizational type is hierarchical, with each staff member reporting to one supervisor, who in turn reports to one supervisor, and so on up the chain. Figure 1.1 shows a typical functional organization.





A functional organization often goes about the work of the project in a siloed fashion. That is, the project deliverables are worked on independently in different departments. This can cause frustration among project managers, because they are the ones held accountable for the results of the project, but they have no means of holding team members from other departments accountable for completing project deliverables.

A project manager in a functional organization should develop strong working relationships with the functional managers. Functional managers are responsible for assigning work to the employees who report to them. They are also responsible for rating the performance of the employees and determining their raises or bonuses. This, as you can imagine, sets up a strong loyalty between the employee and the functional manager as opposed to the employee and the project manager. However, that doesn't mean project managers can't be successful in this type of organization. Building a relationship with the functional managers and maintaining open communications is the key to successful projects in this type of structure. It also helps a great deal if you can contribute to the employee's performance ratings by rating their work on the project.



Project managers have little formal authority in this type of structure, but it doesn't mean their projects are predestined for failure. Communication skills, negotiation skills, and strong interpersonal skills will help assure your success in working within this type of environment.

The functional organization is the most common organizational structure and has endured for centuries. The advantages of a functional organization include the following:

- Growth potential and a career path for employees
- The opportunity for those with unique skills to flourish
- A clear chain of command (each staff member has one supervisor—the functional manager)

The typical disadvantages of a functional organization include the following:

- Project managers have limited to no authority.
- Multiple projects compete for the same limited resources.
- Resources are generally committed part-time to the project rather than full-time.
- Issue resolution follows the department chain of command.
- Project team members are loyal to the functional manager.

#### The Matrix Organization

The next organizational structure covered is a *matrix organization*. There are three types of matrix organizations, as discussed in a moment. Figure 1.2 shows a balanced matrix organization.



FIGURE 1.2 The balanced matrix organization

Matrix organizations typically are organized along departmental lines, like a functional organization, but resources assigned to a project are accountable to the project manager for all work associated with the project. The project manager is often a peer of the functional staff managers. The team members working on the project often have two or more supervisors—their functional manager and the project manager (or managers) they are reporting to.

Project managers working in a matrix organization need to be clear with both the project team members and their respective functional managers about assignments and results regarding the following:

- Those outcomes for which the team member is accountable to the project manager
- Those outcomes for which the team member is accountable to the functional manager

The team member should be accountable to only one person for any given outcome so as to avoid confusion and conflicting direction.

Another trouble area in a matrix organization is availability of resources. If you have a resource assigned 50 percent of the time to your project, it's critical that the functional manager, or other project managers working with this resource, is aware of the time commitment this resource has allocated to your project. If time-constraint issues like this are not addressed, project managers may well discover they have fewer human resources for the project than first anticipated. Addressing resource commitments at the beginning of the project, both during preproject setup and again during the planning phase, will help prevent problems down the road.



In a typical matrix organization, functional managers assign employees to the project, while project managers assign tasks associated with the project to the employee. The following are the typical characteristics of a matrix organization:

- Project manager authority ranges from weak to strong.
- There is a mix of full-time and part-time project resources.
- Resources are assigned to the project within their respective functional areas by a functional manager.
- Project managers and functional managers share authority levels.
- There is better interdepartmental communication.

#### **Matrix Organizations Times Three**

There are three types of matrix organizations:

**Strong Matrix** The strong matrix organization emphasizes project work over functional duties. The project manager has the majority of power in this type of organization.

**Weak Matrix** The weak matrix organization emphasizes functional work over project work and operates more like a functional hierarchy. The functional managers have the majority of power in this type of organization.

**Balanced Matrix** A balanced matrix organization shares equal emphasis between projects and functional work. Both the project manager and the functional manager share power in this type of structure.



Matrix organizations allow project managers to focus on the work of the project. The project team members, once assigned to a project, are free to focus on the project objectives with minimal distractions from the functional department.

It is important that you understand what type of matrix organization you're working in because the organizational type dictates the level of authority you'll have. But don't be fooled into thinking you will have your way more easily in a strong matrix environment. It is still essential that you keep the lines of communication open with functional managers and inform them of status, employee performance, future needs, project progress, and so on.

#### The Projectized Organization

The last type of organizational structure covered is the *projectized organization*, which is shown in Figure 1.3. This organizational structure is far less common than the other two discussed. In this environment, the focus of the organization is projects, rather than functional work units.





Project managers have the majority of power in this type of structure. They are responsible for making decisions regarding the project and for acquiring and assigning resources from inside or outside the organization. Support staff, such as human resources, administrative support, accounting, and so on, often report to the project manager in a projectized environment.

One of the advantages of this type of organization is that team members are *colocated*, meaning they work together at the same physical location. Other advantages of this structure include the following:

- Project manager has full authority to manage the project and resources.
- Full-time resources are assigned to the project and report to the project manager.
- Loyalty is established with the project manager.
- Other ad hoc resources may report to the project manager.
- There is dedicated project support staff.

One of the biggest drawbacks of a projectized organization is reassigning project team members once the project ends. There may not always be a new project waiting for these resources. Again, it's essential that communication is occurring among project managers across the organization so that the complex timing of increasing or decreasing resources is managed as efficiently as possible.

# Validating the Project

Stakeholders have many reasons for bringing about a project. Most organizations don't have the resources or time to execute every project that every stakeholder would like implemented. Validating the project involves two steps: preparing the business case and

identifying and analyzing the project stakeholders. But there are some steps along the way you need to understand before and after the business case is written. First, the organization needs to have an understanding of the business need or demand for the project. Then, the business case is created, which includes a justification for the project, and finally, project selection methods are used to determine which projects the organization should implement.

The first step in validating a project is preparing and validating the business case. The business case typically documents the reasons the project came into existence. Before we dive into the business case specifics, we'll cover some of the needs and demands that bring about projects.

#### **How Projects Come About**

Projects come about for many reasons. For example, some organizations exist to generate profits, and many create projects specifically designed to meet this goal. Other organizations exist to provide services to others with no regard for profits. And they may bring about projects to enhance their ability to meet the demand for their services. No matter what the reason for bringing about a project, most of them will fall into one of the seven needs or demands described next:

**Market Demand** The demands of the marketplace can drive the need for a project. For example, the proliferation of handheld devices has created a need for rechargeable batteries that are capable of holding a charge for 12 hours or more.

**Strategic Opportunity/Business Need** Business needs often drive projects that involve information technology solutions. For example, an organization's accounting system is outdated and no longer able to keep up with current technology. A new system is implemented to help the organization become more efficient and create reports in a timelier manner.

**Customer Request** Customer requests can generate an endless supply of potential projects. For example, perhaps the discussions at a recent customer focus group brought about the idea for a new product offering.

**Technological Advance** Technology and business needs sometimes strike us as a chickenand-egg scenario. Is it the technology that drives the business to think it needs a new product or service, or does the business need drive the development of the new technology? Both scenarios exist, and both bring about the need for new projects.

**Legal Requirement** Local, state, and federal regulations change during every legislative session and may drive the need for a new project. For example, a city may pass an ordinance allowing photos of red-light violations at busy intersections. The new equipment must then be procured and installed. Federal regulations requiring the encryption and secure storage of private data may bring about the need for a project to fulfill these requirements.

#### 🗒 Real World Scenario

#### Assessing the Impact of Regulations and Legal Requirements

Projects often have legislative, regulatory, or other third-party restrictions imposed upon their processes or outputs. For example, suppose you are managing a project that will create a new information technology system for a funds management company, one that's in the business of managing individual stock portfolios. You can imagine that this company is heavily regulated by the Securities and Exchange Commission (SEC) and that your new system, in turn, will encounter several regulatory guidelines that you must follow. The security aspect of your new system is especially pertinent. You must be able to assure the SEC and your shareholders that the system is secure.

It's important that a project manager be able to not only recognize the need to investigate specific industry regulations and requirements but also communicate this need and its associated impact on the project scope and project plan to the stakeholders. Here are a few examples of the many external considerations you need to account for when implementing a technology-based project:

**Legal and Regulatory Conditions** Know the statutes covering the type of activity your deliverable involves. For example, if you collect information about customers, make certain you are complying with privacy laws. Also, you may face government reporting and documentation requirements or public-disclosure rules.

**Licensing Terms** Suppose that part of your project requires that developers write some programming code according to a Microsoft application programming interface (API). You need to be well aware of the licensing ramifications associated with using a Microsoft API. Trademark, copyright, and intellectual property issues all enter into this category.

**Industry Standards** Industry standards exist in almost every aspect of business. Pharmaceutical companies, car manufacturers, food services, and so on, all have industry standards that describe best practices for preparing, manufacturing, shipping, and any number of other elements of their business.

Considerations for industry standards in your organization must be accounted for in the project plan and budget.

**Environmental Considerations** Many organizations today are actively involved in green efforts to protect the environment. For example, perhaps a new Environmental Protection Agency (EPA) mandate requires extra equipment and processes to be implemented in your production assembly line to minimize pollution output. Therefore, a project is required.

**Social Need** Social needs or demands can bring about projects in a variety of ways. For example, a small developing country may have the need for safe, clean drinking water, so

a project is initiated to purchase and install a new filtering system. Another example may include bringing about a project to develop a vaccine for a new flu virus that's predicted to hit the nation.

The needs or demands that bring about a project are usually stated in the business case. You'll look at the business case next.

#### **Business Case Validation and Stakeholder Identification**

A project is validated by preparing a business case and identifying and analyzing stakeholders. There are several steps to validating a business case as well. You'll learn about all these project validation steps next.

#### Validating the Business Case

One of the first things a project manager can do at the onset of a project is to understand the business reason for the project. The business case, which is often based on one of the needs or demands discussed in the previous section, is a written document or report that helps executive management and key stakeholders determine the benefits and rewards of the project. It documents the business need or justification for the project and will often include high-level details regarding estimated budgets and timelines for completing the project.

**Justification** Justification describes the benefits to the organization for undertaking the project. These benefits can include tangible and intangible benefits and should include the reasons for bringing about the project. Justification can be a section within the business case or an independent document.

Alignment to the Strategic Plan Alignment to the strategic plan can also be included within the business case, and it should describe how the project and its outcomes will align to the organization's overall strategic plan. If the reason for the project doesn't support the strategic plan, there's really no reason to undertake the project.

Alternative Solutions This should include a high-level description of costs, the feasibility of implementing each alternative, the expected results of each alternative solution, and a description of any impacts to the organization as a result of this solution. (Cost-benefit, payback, and other financial analyses are generally included in this section of the business case.)

Recommended Solution This section details the recommended solution.

**Feasibility Study** A *feasibility study* is undertaken for several reasons. Feasibility studies can determine whether the project is doable and likely to succeed. They examine the viability of the product, service, or result of the project. They may also examine technical issues related to the project and determine whether it's feasible, reliable, and easily assimilated into the organization's existing infrastructure. Not all business cases will or should include a feasibility study. Feasibility studies are usually conducted when the proposed project is highly complex, has a high potential for risk, or is a new type of project the organization has never undertaken before. Feasibility studies may be conducted as separate projects, as subprojects, or as a preproject phase. It's best to treat this activity as a project when the outcome is uncertain.

#### Identifying and Analyzing Stakeholders

Stakeholders are anyone who has a vested interest in the project. Stakeholders can include individuals as well as organizations, and both the project sponsor and the project manager are considered stakeholders. The project sponsor is the executive in the organization who authorizes the project to begin and is someone who has the ability and authority to assign funds and resources to the project. Identifying stakeholders is also a component of the project charter. Chapter 2 will go into much more detail about stakeholders, and Chapter 3 will talk about the project charter.

#### **Project Selection**

After the business case is created, you'll need some method to decide how you or the project selection committee will choose among competing projects.

*Project selection methods* are used to determine which proposed projects should receive approval and move forward. This process usually includes the allocation of high-level funding as well. Project selection may take place using formal documented guidelines, or it may be informal, requiring only the approval of a certain level of management.

Typically, a high-level board or committee will perform project selection. This committee may be cross-functional in nature and accountable for corporate-wide project selection, or selection may be determined on a departmental basis. A committee at the corporate level is composed of representatives from all departments, such as information technology, sales, marketing, finance, and customer service.

#### **Project Selection Methods**

A project selection committee uses a set of criteria to evaluate and select proposed projects. The selection method needs to be applied consistently across all projects to ensure the company is making the best decision in terms of strategic fit as well as the best use of limited resources.

Project selection methods will vary depending on the mission of the organization, the people serving on the selection committee, the criteria used, and the project itself. These methods could include examining factors such as market share, financial benefits, return on investment, customer satisfaction, and public perception. The exact criteria vary, but selection methods usually involve a combination of decision models and expert judgment.

#### **Decision Models**

A decision model is a formal method of project selection that helps managers make decisions regarding the use of limited budgets and human resources. Requests for projects can span a large spectrum of needs, and it can be difficult to determine a priority without a means of comparison. Is an online order entry application for the sales team more important than the addition of online help for the customer-support team? To the impacted departments, each project is probably viewed as a number-one priority. The problem is that there may not be adequate budget or staffing to complete both requests, and a decision must be made to approve one request and deny the other. Unless you can make an

"apples-to-apples" comparison of the two requests, the decision will be very subjective. A decision model uses a fixed set of criteria agreed on by the project selection committee to evaluate the project requests. By using the same model to evaluate each project request, the selection committee has a common ground on which to compare the projects and make the most objective decision. You can use a variety of decision models, and they range from a basic ranking matrix to elaborate mathematical models.

There are two primary categories of decision models: benefit measurement methods and constrained-optimization models.

#### **Benefit Measurement Methods**

*Benefit measurement methods* provide a means to compare the benefits obtained from project requests by evaluating them using the same criteria. Benefit measurement methods are the most commonly used of the two categories of decision models. Four common benefit measurement methods are cost-benefit analysis, scoring model, payback period, and economic model.

**Cost-Benefit Analysis** A *cost-benefit analysis* compares the cost to produce the product or service to the financial gain (or benefit) the organization stands to make as a result of executing the project. You should include development costs of the product or service, marketing costs, technology costs, and ongoing support, if applicable, when calculating total costs.

Let's say your proposed project involves developing and marketing a new product. The total costs are projected at \$3 million. Based on market research, it appears the demand for this product will be high and that projected revenues will exceed the organization's goals. In this case, the cost-benefit analysis is positive and is a strong indicator you should select this project provided the business case justifies it as well.

The cost-benefit model is a good choice if the project selection decision is based on how quickly the project investment will be recouped from either decreased expenses or increased revenue. The weakness of using a cost-benefit analysis is that it does not account for other important factors, such as strategic value. The project that pays for itself in the shortest time is not necessarily the project that is most critical to the organization.

**Scoring Model** A *scoring model* has a predefined list of criteria against which each project is rated. Each criterion is given both a scoring range and a weighting factor. The weighting factor accounts for the difference in importance of the various criteria. Scoring models can include financial data, as well as items such as market value, organizational expertise to complete the project, innovation, and fit with corporate culture. Scoring models have a combination of objective and subjective criteria. The final score for an individual project request is obtained by calculating the rating and weighting factor of each criteria. Some companies have a minimum standard for the scoring model. If this minimum standard is not obtained, the project will be eliminated from the selection process. A benefit of the scoring model is that you can place a heavier weight on a criterion that is of more importance. Using a high weighting factor for innovation may produce an outcome where a project with a two-year time frame to pay back the cost of the project may be selected over a

project that will recoup all costs in six months. The weakness of a scoring model is that the ranking it produces is only as valuable as the criteria and weighting system the ranking is based on. Developing a good scoring model is a complex process that requires a lot of interdepartmental input at the executive level.

**Payback Period** The *payback period* is a cash flow technique that identifies the length of time it takes for the organization to recover all the costs of producing the project. It compares the initial investment to the expected cash inflows over the life of the project and determines how many time periods elapse before the project pays for itself. Payback period is the least precise of all the cash flow techniques discussed in this section.

You can also use payback period for projects that don't have expected cash inflows. For example, you might install a new call-handling system that generates efficiencies in your call center operations by allowing the call center to grow over the next few years without having to add staff. The cost avoidance of hiring additional staff can be used in place of the expected cash inflows to calculate payback period.



#### **Gustave Eiffel**

The extraordinary engineer Gustave Eiffel put up the majority of the money required to build the Eiffel tower, nearly \$2 million, himself. This was quite a sum in 1889, and his investment paid off. Tourism revenues exceeded the cost of constructing the tower in a little more than one year. That's a payback period any project manager would love to see. And Eiffel didn't stop there. He was wise enough to negotiate a contract for tourism revenues from the tower for the next 20 years.

**Economic Model** An *economic model* is a series of financial calculations, also known as cash flow techniques, which provide data on the overall financials of the project. A whole book can be dedicated to financial evaluation, so here you'll get a brief overview of some of the common terms you may encounter when using an economic model: discounted cash flow, net present value, and internal rate of return.

**Discounted Cash Flow** The *discounted cash flow* technique compares the value of the future worth of the project's expected cash flows to today's dollars. For example, if you expected your project to bring in \$450,000 in year 1, \$2.5 million in year 2, and \$3.2 million in year 3, you'd calculate the present value of the revenues for each year and then add up all the years to determine a total value of the cash flows in today's dollars. Discounted cash flows for each project are then compared to other similar projects on the selection list. Typically, projects with the highest discounted cash flows are chosen over those with lower discounted cash flows.

**Net Present Value** Net present value (NPV) is a cash flow technique that calculates the revenues or cash flows the organization expects to receive over the life of the project in today's dollars. For example, let's say your project is expected to generate revenues over the next five years. The revenues you receive in years 2, 3, and so on, are worth less than

the revenues you receive today. NPV is a mathematical formula that allows you to determine the value of the investment for each period in today's dollars. Each period's resulting sum in present-day dollars is added together, and that sum is then subtracted from the initial investment to come up with an overall value for the project. The rule for NPV is that if NPV is greater than zero, you should accept the project. If it's less than zero, you should reject the project.



The difference between NPV and discounted cash flows is that NPV subtracts the total cash flow in today's dollars from the initial project investment. Discounted cash flow totals the value of each period's expected cash flow to come up with a total value for the project in today's terms.

**Internal Rate of Return** *Internal rate of return (IRR)* is the discount rate when the present value of the cash inflows equals the original investment. IRR states the profitability of an investment as an average percent over the life of the investment. The general rule is that projects with higher IRR values are considered better than projects with lower IRR values.

#### **Constrained Optimization Models**

*Constrained optimization models* are mathematical models, some of which are very complicated. They are typically used in very complex projects and require a detailed understanding of statistics and other mathematical concepts. A discussion of these models is beyond the scope of this book.

#### **Expert Judgment**

*Expert judgment* relies on the expertise of stakeholders, subject-matter experts, or those who have previous experience to help reach a decision regarding project selection. Typically, expert judgment is used in conjunction with one of the decision models discussed previously.

Companies with an informal project selection process may use only expert judgment to make project selection decisions. Although using only expert judgment can simplify the project selection process, there are dangers in relying on this single technique. It is not likely that the project selection committee members will all be authorities on each of the proposed projects. Without access to comparative data, a project approval decision may be made based solely on who has the best slide presentation or who is the best salesperson.

Political influence can also be part of the expert judgment. An executive with a great deal of influence may convince the selection committee to approve a particular project.

Once your selection committee has selected and approved a list of projects, the project manager will move forward with the project management processes. You'll look at one way these processes are organized in the next section.

# Understanding the Project Management Knowledge Areas

The project manager is the person who oversees all the work required to complete the project by using a variety of tools and techniques. The *PMBOK Guide*<sup>®</sup> categorizes these tools and techniques into processes. For example, the Develop Project Charter process outlines inputs, tools and techniques, and outputs for producing the fully documented project charter, which is an output of this process.

The *Project Management Knowledge Areas* are collections of individual processes that have elements in common. For example, the Project Human Resource Management area is comprised of four processes that are all used to help establish, acquire, and manage project resources.

According to the PMBOK Guide®, these are the 10 Project Management Knowledge Areas:

- 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
- Project Stakeholder Management

As you move through subsequent chapters, you will examine these areas in more detail. Keep in mind that these Knowledge Areas may not have equal importance on your next project. For example, if you are performing a project with internal resources and require a minimum amount of goods or supplies for the project, the Project Procurement Management area will have less emphasis in your project-planning activities than the Project Scope Management area.

# Understanding the Role of the Project Manager

As stated earlier in this chapter, the project manager is the person responsible for integrating all the components and artifacts of a project and applying the various tools and techniques of project management to bring about a successful conclusion to the project. The project manager's role is diverse and includes activities such as managing the team; managing communication, scope, risk budget, and time; managing quality assurance; planning; negotiating; solving problems; and more.

Good soft skills are as critical to the success of a project as good technical skills. You'll examine many of the technical skills needed as they relate to the project management processes in the coming chapters, but I won't neglect to talk about the soft skills as well. These are skills any good manager uses on a daily basis to manage resources, solve problems, meet goals, and more.

You probably already use some of these skills in your day-to-day work activities. Here's a partial list:

- Leadership
- Communicating
- Listening
- Organization
- Time management
- Planning
- Problem-solving
- Consensus building
- Resolving conflict
- Negotiating
- Team building

Let's examine a few of these skills in a little more detail.

#### Leadership

A project manager must also be a good leader. Leaders understand how to rally people around a vision and motivate them to achieve amazing results. They set strategic goals, establish direction, and inspire and motivate others. Strong leaders also know how to align and encourage diverse groups of people with varying backgrounds and experience to work together to accomplish the goals of the project.

Leaders possess a passion for their work and for life. They are persistent and diligent in attaining their goals. And they aren't shy about using opportunities that present themselves to better their team members, to better the project results, or to accomplish the organization's mission. Leaders are found at all levels of the organization and aren't necessarily synonymous with people in executive positions. We've known our share of executive staff members who couldn't lead a team down the hall, let alone through the complex maze of project management practices. It's great for you to possess all the technical skills you can acquire as a project manager. But it's even better if you are also a strong leader who others trust and are willing to follow.

#### Communication

Most project managers will tell you they spend the majority of their day communicating. PMI<sup>®</sup> suggests that project managers should spend up to 90 percent of their time in the act of communicating. It is by far the number-one key to project success. Even the most detailed project plan can fail without adequate communication. And of all the communication skills in your tool bag, listening is the most important. Ideally, you've finely honed your leadership skills and have gained the trust of your team members. When they trust you, they'll tell you things they wouldn't have otherwise. As the project manager, you want to know everything that has the potential to affect the outcomes you're striving for or any-thing that may impact your team members.

Project managers must develop a communication strategy for the project that includes the following critical components:

- What you want to communicate
- How often you'll communicate
- The audience receiving the communication
- The medium used for communicating
- Monitoring the outcome of the communication

Keeping these components in mind and developing a comprehensive communication plan early in the project will help prevent misunderstanding and conflict as the project progresses.



We'll discuss communication in more detail in Chapter 8, "Communication Techniques."

#### **Problem-Solving**

There is no such thing as a project that doesn't have problems. Projects always have problems. Some are just more serious than others.

Early recognition of the warning signs of trouble will simplify the process of successfully resolving problems with minimal impact. Many times, warning signs come about during communications with your stakeholders, team members, vendors, and others. Pay close attention not only to what your team members are saying but also to how they're saying it. Body language plays a bigger part in communication than words do. Learn to read the real meaning behind what your team member is saying and when to ask clarifying questions to get the heart of the issue on the table.

We'll discuss specific techniques you can use to help with problem-solving and conflict resolution in Chapter 6, "Resource Planning and Management."

#### Negotiating

Negotiation is the process of obtaining mutually acceptable agreements with individuals or groups. Like communication and problem-solving skills, this skill is used throughout the life of the project.

Depending on the type of organizational structure you work in, you may start the project by negotiating with functional managers for resources. If you will be procuring goods or services from an outside vendor, you will likely be involved in negotiating a contract or other form of procurement document. Project team members may negotiate specific job assignments. Project stakeholders may change the project objectives, which drives negotiations regarding the schedule, the budget, or both. As you execute the project, change requests often involve complex negotiations as various stakeholders propose conflicting requests. There is no lack of opportunity for you to use negotiating skills during the life of a project, and you'll be learning about many of these examples in more detail in the coming chapters.

#### 🗒 Real World Scenario

#### **Negotiating with the Business Unit**

You're working on a project for the human resources department in your company. They'd like to streamline the recruitment process and set up a website for applicants to view the job descriptions and apply online. The hiring managers also need a streamlined way to quickly review resumes and applications and arrange for interviews with qualified candidates. You've gotten past the initial project request steps, and you're now in the process of determining the details of the requirements for the project.

You set up a meeting with the director of human resources. At the meeting you ask her two things. First, you want to know whether you can use someone from the business unit to assist you in understanding the business process flows. You make it clear that the assigned individual must be a subject-matter expert (SME) in the business process. Second, you ask whether you can have this individual full-time for one week. You suggest the name of someone whom you think will perform well as a business SME.

The director is surprised that you require so much time from one of her people. She asks you to more thoroughly explain your needs. You explain to her that in order for you to create a website that fully meets the business needs, you must understand how the business process works today and how it can be improved.

After some discussion back and forth, the two of you come to an agreement that you can have three days of someone's time and that you'll use two different business SMEs, splitting their efforts accordingly so that neither one has to fully dedicate their time to the business flow discovery process. The director stresses to you that her people are busy, and she is being generous in letting you have them at all.

You agree, thank her for her time, and get to work figuring out the best questions to ask the SMEs in order to complete the business flow discovery process in as efficient and timely a manner as possible.

#### **Organization and Time Management**

As stated earlier in this chapter, the project manager oversees all aspects of the work involved in meeting the project goals. The ongoing responsibilities of a typical project manager include tracking schedules and budgets and providing updates on their status, conducting regular team meetings, reviewing team member reports, tracking vendor progress, communicating with stakeholders, meeting individually with team members, preparing formal presentations, managing change requests, and much more. This requires excellent organizational skills and the ability to manage your time effectively. I've found that most project managers are good time managers as well, but if you struggle in this area, I strongly recommend taking a class or two on this topic.

Meetings consume valuable project time, so make certain they are necessary and effective. Effective meetings don't just happen—they result from good planning. Whether you conduct a formal team meeting or an individual session, you should define the purpose of the meeting and develop an agenda of the topics to be discussed or covered. It's good practice to make certain each agenda item has a time limit in order to keep the meeting moving and to finish on time. In my experience, the only thing worse than team members coming late to a scheduled meeting is a meeting that goes past its allotted time frame.

Clear documentation is critical to project success, and you'll want a system that allows you to put your hands on these documents at a moment's notice. Technology comes to the rescue with this task. Microsoft SharePoint is an excellent tool to help you organize project documents. Other tools are available to you as well. Find one that works, even if it's a manual system, and keep it up-to-date.

### Summary

A project is a temporary endeavor that produces a unique product service or result. It has definitive start and finish dates. Project management is the application of tools and techniques to organize the project activities to successfully meet the project goals. A project manager is responsible for project integration and applying the tools and techniques of project management to bring about a successful conclusion to the project.

Organizational structures impact how projects are managed and staffed. The primary structures are functional, matrix, and projectized. The traditional departmental hierarchy in a functional organization provides the project manager with the least authority. The other end of the spectrum is the project-based organization, where resources are organized around projects; in these types of organizations, the project manager has the greatest level of authority to take action and make decisions regarding the project. The matrix organization is a middle ground between the functional organization and the project-based organization.

Programs are a collection or group of related projects that are managed together using coordinated processes and techniques. The collective management of a group of projects can bring about benefits that wouldn't be achievable if the projects were managed separately.

Portfolios are collections of programs, subportfolios, and projects that support strategic business goals or objectives. Portfolios may consist of projects that are not related.

Project selection techniques involve the use of decision models, such as a cost-benefit analysis and expert judgment, to allocate limited resources to the most critical projects.

Project managers are individuals charged with overseeing every aspect of a given project from start to finish. A project manager needs not only technical knowledge of the product or service being produced by the project but also a wide range of general management skills. Key general management skills include leadership, communication, problem-solving, negotiation, organization, and time management.

# **Exam Essentials**

**Be able to define a project.** A project brings about a unique product, service, or result and has definite beginning and ending dates.

Be able to identify the difference between a project and ongoing operations. A project is a temporary endeavor to create a unique product or service. Operational work is ongoing and repetitive.

Be able to define a program and a portfolio. A program is a group of related projects managed to gain benefits that couldn't be realized if they were managed independently. Portfolios are collections of programs, subportfolios, and projects that support strategic business goals or objectives. Programs and projects within the portfolio may not be related to one another.

Name the three types of organizational structures. The three types of organizational structures are functional, matrix, and projectized structures. Matrix organizations may be structured as a strong matrix, weak matrix, or balanced matrix organization.

Be able to define the role of a project manager. A project manager's core function is project integration. A project manager leads the project team and oversees all the work required to complete the project goals to the satisfaction of the stakeholders.

Be able to identify the most common project selection methods. The most common project selection methods are benefit measurement methods such as cost-benefit analysis, scoring models, payback period, and economic models (which include discounted cash flows, NPV, and IRR), as well as expert judgment.

Understand what skills are needed to manage a project beyond technical knowledge of the product. Key general management skills include leadership, communication, problem-solving, negotiation, organization, and time management.

# Key Terms

Before you take the exam, be certain you are familiar with the following terms:

A Guide to the Project Management Body of Knowledge (PMBOK Guide<sup>®</sup>) benefit measurement methods colocated constrained optimization models cost-benefit analysis decision model discounted cash flow economic model expert judgment feasibility study functional organization internal rate of return (IRR) matrix organization net present value (NPV) operations payback period portfolio program project project management Project Management Institute (PMI®) Project Management Knowledge Areas project managers project selection methods projectized organization scoring model

# **Review Questions**

- **1.** What is the definition of a project? Choose two.
  - A. A group of interrelated activities that create a unique benefit to the organization
  - **B.** Through the use of project management techniques, which are repeatable processes, a series of actions that are performed to produce the same result multiple times
  - C. A temporary endeavor undertaken to create a unique product, service, or result
  - **D.** A process used to generate profit, improve market share, or adhere to legal requirements
  - **E.** A time-constrained endeavor with assigned resources responsible for meeting the goals of the project according to the quality standards
- 2. What organization is recognized worldwide for setting project management standards?
  - A. PMC
  - B. PMI®
  - **C**. PMP
  - D. CompTIA
- 3. What is the term for a group of related projects managed in a coordinated fashion?
  - A. Life cycle
  - B. Phase
  - C. Process group
  - D. Program
- 4. Which of the following are true regarding project portfolios? Choose two.
  - A. The independent projects in the portfolio may not have anything in common.
  - **B.** The programs in the portfolio are related to one another.
  - **C.** The programs and projects within the portfolio support the strategic goals of the portfolio.
  - **D.** An organization has only one portfolio.
  - E. Portfolios consist of programs and do not contain stand-alone projects.
- **5.** Which of the following general management skills does a project manager employ up to 90 percent of their time?
  - A. Programming
  - B. Communicating
  - C. Leading
  - **D.** Problem-solving
- **6.** You receive a request from customer service to develop and implement a desktop management system for the customer-support staff. What type of project request is this?
  - A. Business need
  - B. Market demand
  - C. Legal requirement
  - D. Technological advance

- **7.** You are working in a matrix organization. Choose two responses that describe this type of structure.
  - **A.** Project resources are members of another business unit and may or may not be able to help you full-time.
  - B. Matrix organizations can be structured as strong, weak, or balanced.
  - C. Project managers have the majority of power in this type of structure.
  - **D**. This organizational structure is similar to a functional organization.
  - E. Employees are assigned project tasks by their project manager in this type of structure.
- 8. A project manager has the most authority under which organizational structure?
  - A. Projectized
  - B. Functional
  - **C.** Balanced matrix
  - **D.** Strong matrix
- **9.** Your project has expected cash inflows of \$7.8 million in today's dollars. Which cash flow technique was used to determine this?
  - **A.** Discounted cash flow
  - **B**. IRR
  - C. NPV
  - **D.** Cost-benefit analysis
- 10. Which of the following are the steps required to validate a project? Choose two.
  - **A.** Analyze the feasibility.
  - B. Justify the project.
  - **C.** Align it to the strategic plan.
  - **D.** Validate the business case.
  - E. Identify and analyze stakeholders.
- **11.** This general management skill concerns obtaining mutually acceptable agreements with individuals or groups.
  - A. Leadership
  - B. Problem-solving
  - C. Negotiating
  - **D.** Communicating
- **12.** Federico, the director of the marketing department, has approached you with an idea for a project. What are the elements you'll include in the business case? Choose four.
  - A. The business justification for the project
  - **B**. The strategic opportunity/business need that brought about the project
  - **C.** The recommended alternative
  - D. List of key stakeholders
  - **E.** Alternative solutions analysis

- **13.** Your project has expected cash inflows of \$1.2 million in year 1, \$2.4 million in year 2, and \$4.6 million in year 3. The project pays for itself in 23 months. Which cash flow technique was used to determine this?
  - **A.** IRR
  - **B**. NPV
  - **C.** Discounted cash flow
  - D. Payback period
- **14.** You've been given an idea for a project by an executive in your organization. After writing the business-case analysis, you submit it to the executive for review. After reading the business case, he determines that the project poses a significant amount of risk to the organization. What do you recommend next?
  - **A.** Proceed to the project selection committee.
  - **B.** Reject the project based on the analysis.
  - **C.** Proceed to writing the project plan.
  - **D.** Perform a feasibility study.
- **15.** You're a project manager working on a software development project. You are working hand in hand with a systems analyst who is considered an expert in her field. She has years of experience working for the organization and understands not only systems development but also the business area the system will support. Which person should make the decisions about the management of the project?
  - **A.** Project manager
  - B. Systems analyst
  - **C.** Project manager with input from systems analyst
  - D. Systems analyst with input from project manager
- 16. What is one disadvantage of a projectized organization?
  - A. The organization doesn't work on anything that isn't project-related.
  - **B.** Costs are high because specialized skills are required to complete projects in this type of structure.
  - **C.** The functional managers have control over which team members are assigned to projects.
  - **D.** Once the project is completed, the project team members may not have other projects to work on.
- 17. Which of the following are reasons for bringing about a project? Choose three.
  - A. Feasibility study
  - B. Market demand
  - **C.** Business case justification
  - D. Strategic opportunity
  - E. Stakeholder needs
  - F. Social needs

- **18.** Your project has expected cash inflows of \$7.8 million in today's dollars. The project's initial investment is \$9.2 million. Which of the following is true?
  - **A.** The discounted cash flows are lower than the initial investment, so this project should be rejected.
  - **B.** The discounted cash flows are lower than the initial investment, so this project should be accepted.
  - **C.** NPV is less than zero, so this project should be rejected.
  - **D**. NPV is greater than zero, so this project should be accepted.
- **19.** The executives in your organization typically choose which projects to perform first by reviewing the business case and then determining, based on their experience with similar projects, which will likely perform well and which will not. What form of project selection method is this?
  - **A.** Business case analysis
  - B. Expert judgment
  - C. Feasibility analysis
  - **D**. Decision model technique
- 20. Which two elements should always be included in a business case analysis? Choose two.
  - A. Feasibility study
  - B. Project selection methodology
  - **C.** Alignment to the strategic plan
  - **D**. Justification
  - E. Cash flow techniques to determine financial viability