THE LIFE OF A PROJECT

CHAPTERS

1 Project Management Concepts	2 Needs Identification	3 Proposed Solutions	4 The Project
Provides an overview of project management concepts, the project life cycle, and the steps in the project management process.	Discusses identifying needs and soliciting proposals, the first phase of the project life cycle.	Explains the development of proposals for addressing a need or solving a problem, the second phase of the project life cycle.	Discusses the implementation of the proposed solution, the third phase of the project life cycle, including what is involved in planning and controlling the project. It also covers what should be done in the termination phase of the project life cycle.

The chapters in Part 1 introduce the concepts of project management and the project life cycle. A project is an endeavor to accomplish a specific objective through a unique set of interrelated tasks and the effective utilization of resources. It has a well-defined objective stated in terms of scope, schedule, and cost. Projects are "born" when a need is identified by the customer—the people or the organization willing to provide funds to have the need satisfied.

The first phase of the project life cycle involves the identification of a need, problem, or opportunity and can result in the customer's requesting proposals from individuals, a project team, or organizations (contractors) to address the identified need or solve the problem. The second phase of the project life cycle is the development of a proposed solution to the need or problem. This phase results in the submission of a proposal to the customer by one or more individuals or organizations. The third phase of the project life cycle is the implementation of the proposed solution. This phase, which is referred to as performing the project, results in accomplishment of the project objective, leaving the customer satisfied that the full scope of work was completed in a quality manner, within budget, and on time. The final phase of the project life cycle is terminating the project.

Project management involves the process of first establishing a plan and then implementing that plan to accomplish the project objective. Taking the time to develop a well-thought-out plan is critical to the successful accomplishment of any project. Once the project starts, the project management process involves monitoring progress to ensure that everything is going according to plan. The key to effective project control is measuring actual progress and comparing it to planned progress on a timely and regular basis and taking corrective action immediately, if necessary.

The ultimate benefit of implementing project management techniques is having a satisfied customer—whether you are the customer of your own project or a business (contractor) being paid by a customer to perform a project. Completing the full scope of work of the project in a quality manner, on time, and within budget provides a great feeling of satisfaction. When projects are successful, everybody wins!
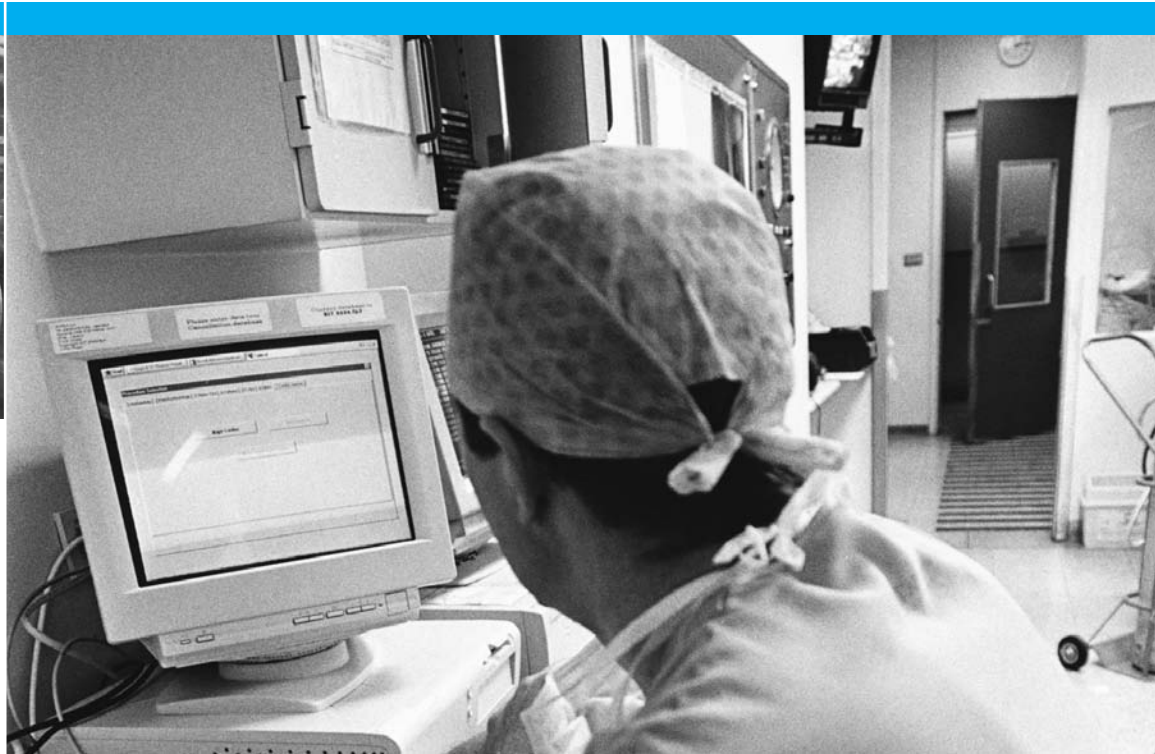
Chapter

1

PROJECT MANAGEMENT CONCEPTS

REAL WORLD PROJECT MANAGEMENT

Project Management for Better Health

Pat Ryan, the chief information officer for the Interior Health Authority (IHA) in the province of British Columbia, Canada, used basic project management concepts to successfully implement two major IT projects for a large health care system. Here's a look at how he did it.

The IHA serves 690,000 people, 28 acute care facilities, 91 health units, 183 locations, 740 private contracts, 17,000 employees, and 1,200 physicians in British Columbia. The federal Canadian government, its ten provinces, and three territories work together to provide health care for its eligible residents through a national health insurance program. To manage and deliver the insured health services, the province of British Columbia formed the IHA five years ago by merging together several entities: five health regions and 14 health councils. The newly formed IHA needed a single, integrated business system. Pat Ryan's job was to combine 19 independent, multiplatform business and clinical systems.

Specifically, the objective of the Business Systems Implementation (BSI) project was to integrate over 100 independent financial applications into a single system. The system would be used for internal financial controls. The goal of the second project, Clinical Systems Implementation (CSI), was to consolidate and standardize the electronic health record. The health record would be accessible to staff and physicians at on- and off-site facilities.

Ryan began by establishing executive support for both projects. Executives were involved from the beginning of the projects to resolve problems, help eliminate barriers, and accept accountability for the projects. The projects were analyzed for cost-benefit to confirm that they fit into the IHA mission. The estimated cost for the BSI project was Can$3.2 million, but the project would save the IHA Can$4.3 million annually in administrative costs. CSI project would cost Can$20 million to create a standardized and accessible electronic health record.

Ryan next focused on developing effective and empowered project teams. In general, managers in each project established open channels of communication, conducted frequent project reviews, and followed a protocol to assess and take action to avoid risk. For the BSI project, teams were created in a hierarchical organization, with executive support at the top. A steering committee was created, consisting of project managers assigned to each specialized module of the new financial system, and was responsible for producing biweekly reports to the executive at the top, and quarterly reports to the IHA board. The 34 teams involved in the CSI project collaborated on a project charter, to help team members feel a sense of ownership for the project. They also created a formal communication plan to share information with key stakeholders.

The BSI project took 14 months on time and under budget, with no major issues or downtime. The new integrated financial system now generates Can$4.3 million in annual savings. The CSI project is being implemented in phases by geographical location. Phases 1 and 2 have been completed and so far about 70 percent of the organization's physicians already use the new electronic health record on- and off-site. The largest implementation phase is scheduled for April 2005. The success of these two projects is further proven by these real and measurable results: cost savings and the high user acceptance rate.

Wyllie, T., "Back to Basics—Practical Magic for Project Management Success," *CMA Management,* April 2004, pp. 33–37.

This chapter presents an overview of project management concepts. You will become familiar with

- the definition of a project and its attributes
- the key constraints within which a project must be managed
- how a project is "born"
- the life of a project
- the steps involved in the project management process
- the benefits of project management

ATTRIBUTES OF A PROJECT

A **project** is an endeavor to accomplish a specific objective through a unique set of interrelated tasks and the effective utilization of resources. The following attributes help define a project:

- A project has a well-defined **objective**—an expected result or product. The objective of a project is usually defined in terms of *scope, schedule,* and *cost.* For example, the objective of a project might be to introduce to the market—in 10 months and within a budget of $500,000—a new food preparation appliance that meets certain predefined performance specifications. Furthermore, it is expected that the work scope will be accomplished in a *quality manner* and to the *customer's satisfaction.*
- A project is carried out through a series of *interdependent tasks*—that is, a number of nonrepetitive tasks that need to be accomplished in a certain sequence in order to achieve the project objective.
- A project utilizes various *resources* to carry out the tasks. Such resources can include different people, organizations, equipment, materials, and facilities. For example, a wedding is a project that may involve resources such as a caterer, a florist, a limousine, and a reception hall.
- A project has a *specific time frame,* or finite life span. It has a start time and a date by which the objective must be accomplished. For example, the refurbishing of an elementary school might have to be completed between June 20 and August 20.
- A project may be a *unique* or *one-time endeavor.* Some projects, like designing and building a space station, are unique because they have never before been attempted. Other projects, such as developing a new product, building a house, or planning a wedding, are unique because of the customization they require. For example, a wedding can be a simple, informal occasion, with a few friends in a chapel, or a spectacular event staged for a prince.
- A project has a customer. The **customer** is the entity that provides the funds necessary to accomplish the project. It can be a person, an organization, or a group of two or more people or organizations. When a contractor builds a customized home for a couple, the couple is the customer funding the project. When a company receives funds from the government to develop a robotic device for handling radioactive material, the customer is the government agency. When a company provides funds for a team of its employees to upgrade the firm's management information system, the term

customer takes on a broader definition, including not only the project funder (the company's management) but also other stakeholders, such as the people who will be the end users of the information system. The person managing the project and the project team must successfully accomplish the project objective to satisfy the customer(s).

- Finally, a project involves a *degree of uncertainty*. Before a project is started, a plan is prepared based on certain assumptions and estimates. It is important to document these assumptions, because they will influence the development of the project budget, schedule, and work scope. A project is based on a unique set of tasks and estimates of how long each task should take, various resources and assumptions about the availability and capability of those resources, and estimates of the costs associated with the resources. This combination of assumptions and estimates causes a degree of uncertainty that the project objective will be completely accomplished. For example, the project scope may be accomplished by the target date, but the final cost may be much higher than anticipated because of low initial estimates for the cost of certain resources. As the project proceeds, some of the assumptions will be refined or replaced with factual information. For example, once the conceptual design of a company's annual report is finalized, the amount of time and effort needed to complete the detailed design and printing can be better estimated.

The following are some examples of projects:

Staging a theatrical production

Developing and introducing a new product

Planning a wedding

Designing and implementing a computer system

Issuing a new $1.00 coin

Modernizing a factory

Consolidating two manufacturing plants

Converting a basement to a family room

Hosting a conference

Designing and producing a brochure

Executing an environmental cleanup of a contaminated site

Holding a high school reunion

Building a shopping mall

Performing a series of surgeries on an accident victim

Putting on a centennial celebration

Rebuilding a town after a natural disaster

Hosting a dinner for 20 relatives

Designing a business internship program for high school students

Building a tree house

The successful accomplishment of the project objective is usually constrained by four factors: *scope, cost, schedule,* and *customer satisfaction* (see Figure 1.1).

FIGURE 1.1   Factors Constraining Project Success
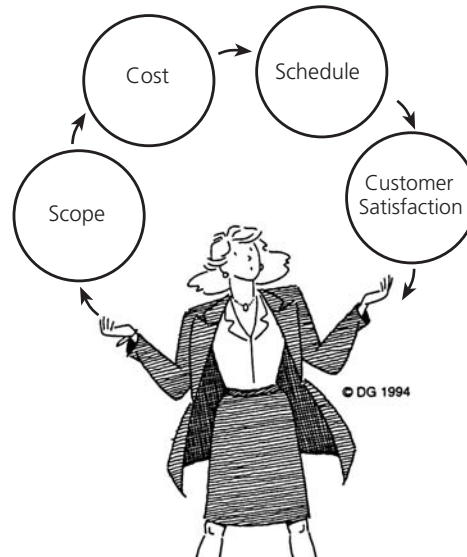
Courtesy of Dynamic Graphics, Inc.

The scope of a project—also known as the **project scope** or the **work scope**—is all the work that must be done in order to satisfy the customer that the **deliverables** (the tangible product or items to be provided) *meet the requirements or acceptance criteria agreed upon at the onset of the project*. For example, the project scope might be all of the work involved in clearing the land, building a house, and landscaping to the specifications agreed upon by the contractor and the buyer. The customer expects the work scope to be accomplished in a quality manner. For example, in a house-building project, the customer expects the workmanship to be of the highest quality. Completing the work scope but leaving windows that are difficult to open and close, faucets that leak, or a landscape full of rocks will result in an unsatisfied customer.

The **cost** of a project is the amount the customer has agreed to pay for acceptable project deliverables. The project cost is based on a budget that includes an estimate of the costs associated with the various resources that will be used to accomplish the project. It might include the salaries of people who will work on the project, materials and supplies, rental of equipment or facilities, and the fees of subcontractors or consultants who will perform some of the project tasks. For example, if the project is a wedding, budgeted items might include flowers, gown, tuxedo, caterer, cake, limousine rental, photographer, and so on.

The **schedule** for a project is the timetable that specifies when each activity should start and finish. The project objective usually states the time by which the project scope must be completed in terms of a specific date agreed upon by the customer and the individual or organization performing the work. It might be the date when a town's centennial celebration will take place or the date by which you want to complete the addition of a family room to your home.

The objective of any project is to complete the scope within budget by a certain time to the customer's satisfaction. To help assure the achievement of this objective, *it is important to develop a plan before the start of the project; this plan should include all the work tasks, associated costs, and estimates of the time necessary to complete them.* The lack of such a plan increases the risk of failing to accomplish the full project scope within budget and on schedule.

Once a project is started, unforeseen circumstances may jeopardize the achievement of the project objective with respect to scope, cost, or schedule.

- The cost of some of the materials may be higher than originally estimated.
- Inclement weather may cause a delay.
- Additional redesign and modifications to a sophisticated piece of automated machinery may be required to get it to meet the performance specifications.

The challenge to the project manager is to prevent, anticipate, or overcome such circumstances in order to complete the project scope on schedule, within budget, and to the customer's satisfaction. *Good planning and communication* are essential to prevent problems from occurring or to minimize their impact on the achievement of the project objective when they do occur. The project manager needs to be proactive in planning and communicating and provide leadership to the project team to accomplish the project objective.
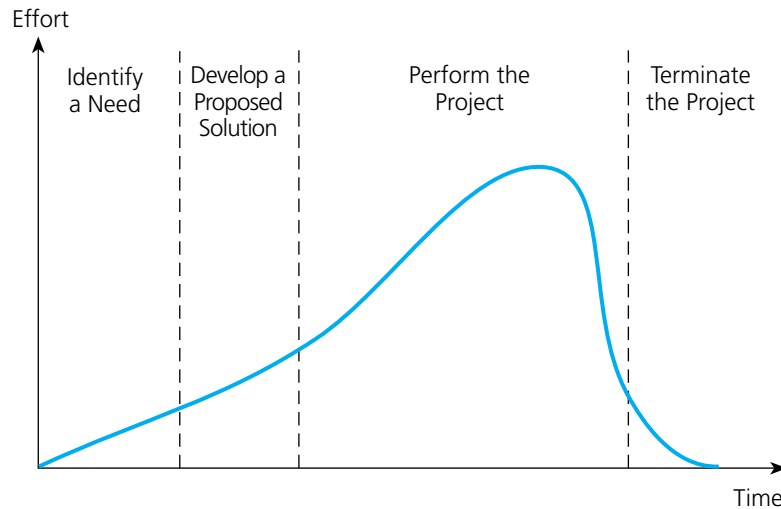
Ultimately, the responsibility of the project manager is to make sure the customer is satisfied. This goes beyond just completing the project scope within budget and on schedule or asking the customer at the end of the project if he or she is satisfied. It requires ongoing communication with the customer to keep the customer informed and to determine whether expectations have changed. Regularly scheduled meetings or progress reports, frequent phone discussions, and e-mail are examples of ways to accomplish such communications. Customer satisfaction means involving the customer as a partner in the successful outcome of the project through active participation during the project. The project manager must be aware of the degree of customer satisfaction throughout the project. By maintaining regular communication with the customer, the project manager demonstrates to the customer that he or she is genuinely concerned about the expectations of the customer; it also prevents unpleasant surprises later.

PROJECT LIFE CYCLE

Figure 1.2 shows the four phases of the **project life cycle** and the relative amount of effort and time devoted to each phase. As the project moves through its life cycle, different organizations, individuals, and resources play dominant roles.

Projects are "born" when a need is identified by the *customer*—the people or the organization willing to provide funds to have the need satisfied. For example, for a growing family, the need may be for a

FIGURE 1.2   Project Life Cycle Effort

Effort

| Identify a Need | Develop a Proposed Solution | Perform the Project | Terminate the Project |

Time

larger house, whereas for a company the problem may be a high scrap rate from its manufacturing process that makes its costs higher and production times longer than those of its competitors. The customer first must identify the need or problem. Sometimes the problem is identified quickly, as in the case of a disaster such as an earthquake or explosion. In other situations, it may take months for a customer to clearly identify a need, gather data on the problem, and define certain requirements that must be met by the person, project team, or contractor who will solve the problem.

This *first phase* of the project life cycle involves the identification of a need, problem, or opportunity and can result in the customer's requesting proposals from individuals, a project team, or organizations (contractors) to address the identified need or solve the problem. The need and requirements are usually written up by the customer in a document called a **request for proposal (RFP).** Through the RFP, the customer asks individuals or contractors to submit proposals on how they might solve the problem, along with the associated cost and schedule. A couple who need a new house may spend time identifying requirements for the house—size, style, number of rooms, location, maximum amount they want to spend, and date by which they would like to move in. They may then write down these requirements and ask several contractors to provide house plans and cost estimates. A company that has identified a need to upgrade its computer system might document its requirements in an RFP and send it to several computer consulting firms.

Not all situations involve a formal RFP, however. Needs often are defined informally during a meeting or discussion among a group of individuals. Some of the individuals may then volunteer or be asked to prepare a proposal to determine whether a project should be undertaken to address the need. Such a scenario might be played out when the management of a hospital wants to establish an on-site day care center for the children of its employees. The management team

or a specific manager may write down the requirements in a document and give it to an internal project team, which in turn will submit a proposal for how to establish the center. In this case, the contractor is the hospital's own internal project team, and the customer is the hospital's manager or, possibly, board of directors. It is important to define the right need. For example, is the need to provide an on-site day care center, or is it to provide child care for the children of the hospital's employees? Is "on-site" necessarily part of the need?

The *second phase* of the project life cycle is the development of a proposed solution to the need or problem. This phase results in the submission of a **proposal** to the customer by one or more individuals or organizations (contractors) who would like to have the customer pay them to implement the proposed solution. In this phase, the contractor effort is dominant. Contractors interested in responding to the RFP may spend several weeks developing approaches to solving the problem, estimating the types and amounts of resources that would be needed as well as the time it would take to design and implement the proposed solution. Each contractor documents this information in a written proposal. All of the contractors submit their proposals to the customer. For example, several contractors may submit proposals to a customer to develop and implement an automated invoicing and collection system. After the customer evaluates the submissions and selects the winning proposal, the customer and the winning contractor negotiate and sign a **contract** (agreement). In many situations, a request for proposal may not involve soliciting competitive proposals from external contractors. A company's own internal project team may develop a proposal in response to a management-defined need or request. In this case, the project would be performed by the company's own employees rather than by an external contractor.

The *third phase* of the project life cycle is the implementation of the proposed solution. This phase begins after the customer decides which of the proposed solutions will best fulfill the need and an agreement is reached between the customer and the individual or contractor who submitted the proposal. This phase, referred to as performing the project, involves doing the detailed planning for the project and then implementing that plan to accomplish the project objective. During the course of performing the project, different types of resources will be utilized. For example, if the project is to design and construct an office building, the project effort might first involve a few architects and engineers in developing the building plans. Then, as construction gets under way, the resources needed will substantially increase to include steelworkers, carpenters, electricians, painters, and the like. The project will wind down after the building is finished, and a smaller number of different workers will finish up the landscaping and final interior touches. This phase results in the accomplishment of the project objective, leaving the customer satisfied that the full scope of the work was completed in a quality manner, within budget, and on time. For example, the third phase is complete when a contractor has completed the design and installation of a customized automation system that satisfactorily passes performance tests and is accepted by the customer or when an internal project team within a company has

completed a project, in response to a management request, which consolidated two of its facilities into one.

The *final phase* of the project life cycle is terminating the project. When a project is completed, certain close-out activities need to be performed, such as confirming that all deliverables have been provided to and accepted by the customer, that all payments have been collected, and that all invoices have been paid. An important task during this phase is evaluating performance of the project in order to learn what could be improved if a similar project were to be carried out in the future. This phase should include obtaining feedback from the customer to determine the level of the customer's satisfaction and whether the project met the customer's expectations. Also, feedback should be obtained from the project team in the form of recommendations for improving performance of projects in the future.

Project life cycles vary in length from a few weeks to several years, depending on the content, complexity, and magnitude of the project. What's more, not all projects formally go through all four phases of the project life cycle. If a group of community volunteers decide that they want to use their own time, talents, and resources to organize a food drive for the homeless, they may get right into phase 3—planning the event and carrying it out. The first two phases of the life cycle would not be relevant to such a project. Likewise, if a company's general manager determines that changing the layout of equipment in the factory will increase efficiency, she might simply instruct the manufacturing manager to initiate such a project and to implement it using the company's own people. In this case, there would be no written request for proposal from external contractors.

In other situations, such as a home remodeling project for which a contractor will likely be hired, a customer may go through the first two phases of the project life cycle in a less structured, more informal manner. He may not write down all of the requirements and ask several contractors for estimates. Rather, he may call a contractor who has done satisfactory work for him or for a neighbor in the past, explain what he wants done, and ask the contractor to provide some sketches and a cost estimate.

In general, the project life cycle is followed in a more formal and structured manner when a project is conducted in a business setting. It tends to be less formal when a project is carried out by a private individual or volunteers.

THE PROJECT MANAGEMENT PROCESS

Succinctly, the project management process means *planning the work and then working the plan*. A coaching staff may spend hours preparing unique plans for a game; the team then executes the plans to try to meet the objective—victory. Similarly, project management involves a process of first *establishing a plan* and then *implementing that plan* to accomplish the project objective.

The front-end effort in managing a project must be focused on establishing a baseline plan that provides a roadmap for how the project

REAL **WORLD PROJECT MANAGEMENT**
Making Movies

Musaffar Ali, a well-known filmmaker in India, was in the process of making his movie *Zooni* in January 1989. The movie is based on the life of a woman named Habba Khatoon, a legendary poet born in Kashmir, the mountainous region north of Pakistan.

Ali was forced to stop his dream project when violence broke out in Kashmir, where he was filming. Fourteen years later, with peace beginning to enter the region, Ali is getting ready to return to complete his movie. As an expert in project management, what could you offer to do to help him reach is goal?

A movie production is good example of a large-scale project. It consists of multiple tasks that are carried out by a movie crew. These tasks have to meet requirements that are documented in a movie script. It has a schedule: a feature film is typically produced for a specific release date. It has a budget: a movie's success is usually measured by comparing production costs to the amount of money it makes after it is released to the public. You, as his movie production manager, could use project management principles to keep the movie production on schedule and within budget.

Debbie Brubaker, producer of the 2003 Sundance film *Dopamine*, has over 20 years of experience as a production manager. She describes the movie production process and provides advice for a successful movie production. At the start, the management team performs a "script breakdown." A script breakdown is a breakdown of tasks and other factors that will help determine the production schedule and budget. This includes counting the number of filming locations and speaking parts specified in the movie script, noting the types of cars called for in the script, the number of stunts, and the number of special effects. In general, productions that have fewer filming locations and speaking parts will cost less. To contain costs, the production manager should limit the number of filming locations; work on exterior scenes first; and should not schedule difficult scenes at the beginning or at the end. Difficult scenes, such as emotional scenes and important story plot events, require more time. You also will need to establish open communication with the movie's assistant director. The assistant director has overall accountability for the schedule, but it would be your job as the production manager to make sure that the production stays on schedule.

Musaffar Ali intends to finish his dream project within one year. By using sound project management principles, he should be able to stay within budget and finish his movie as planned.

Kapoor, D., "What It Takes to Complete a Project on Time and on Budget," *Digital Video Magazine*, August 1, 2003, p. 26.

"14 Years On, Indian Filmmaker Wants to Complete Dream Project in Kashmir," *Financial Times Information Ltd*.

scope will be accomplished on time and within budget. This planning effort includes the following steps:

1. *Clearly define the project objective*. The definition must be agreed upon by the customer and the individual or organization who will perform the project.

2. *Divide and subdivide the project scope into major "pieces," or* **work packages.** Although major projects may seem overwhelming when viewed as a whole, one way to conquer even the most monumental endeavor is to break it down. A **work breakdown structure (WBS)** is a hierarchical tree of work elements or items accomplished or produced by the project team during the project. The work breakdown structure usually identifies the organization or individual responsible for each work package. Figure 1.3 is an

FIGURE 1.3   Work Breakdown Structure

Level 0

Festival
Lynn

Level 1

	1		2		3		4	

Promotion	List of Volunteers	Games	Rides
Lynn	*Beth*	*Steve*	*Pat*

Level 2

1.1	1.2	1.3		3.1	3.2	3.3		4.1	4.2

Newspaper Ads	Posters	Tickets	Booths	Games	Prizes	Amusement Contractor	Permits
Lynn	*Keith*	*Andrea*	*Jim*	*Steve*	*Jeff*	*Pat*	*Neil*

Level 3
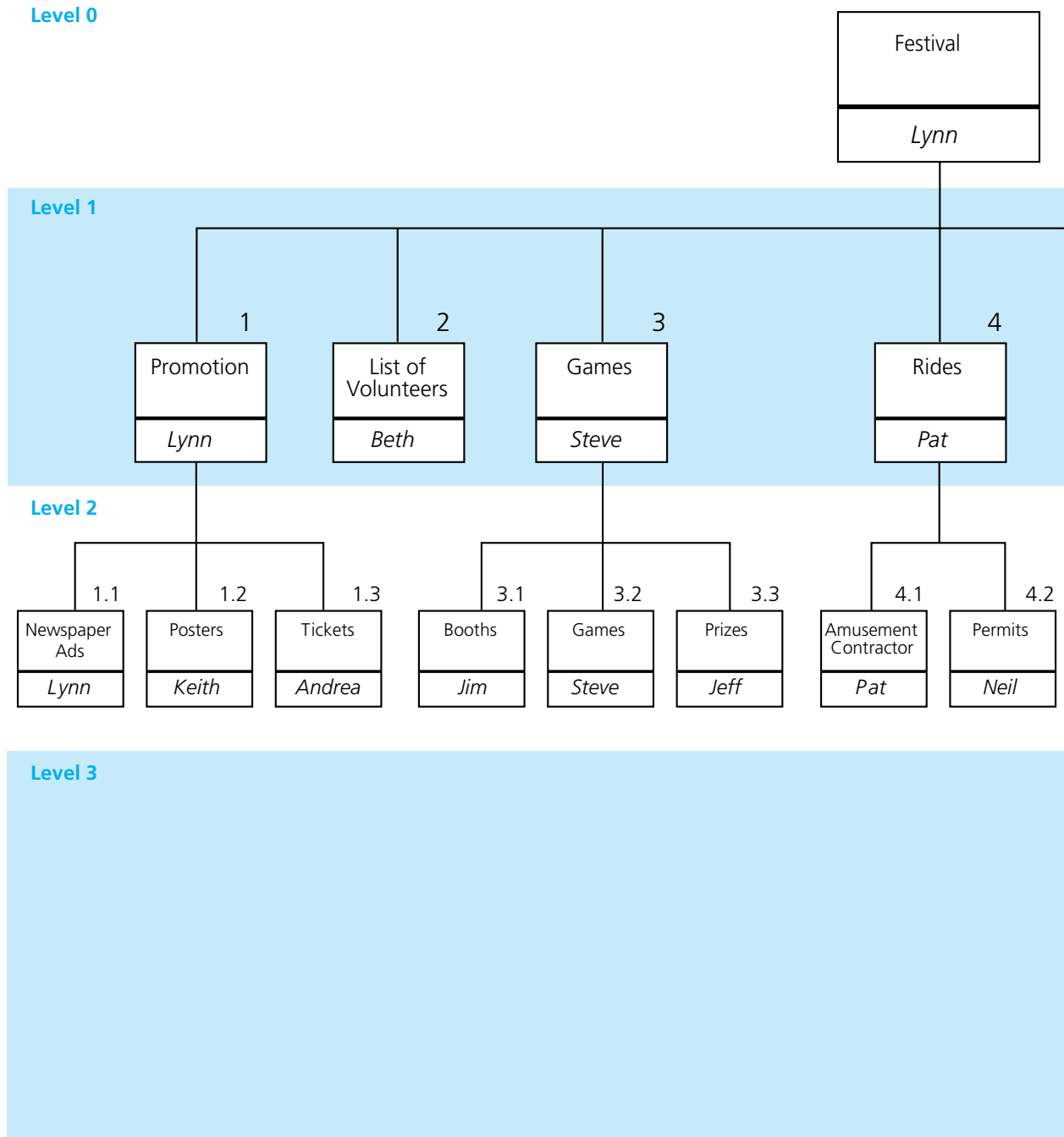
example of a work breakdown structure. (Work breakdown struc-
tures will be discussed further in Chapter 5.)

3. *Define the specific activities that need to be performed for each work
    package in order to accomplish the project objective.*

4. *Graphically portray the activities in the form of a* **network diagram.**
    This diagram shows the necessary sequence and inter-
    dependencies of activities to achieve the project objective.
    Figure 1.4 is an example of a network diagram. (Network dia-
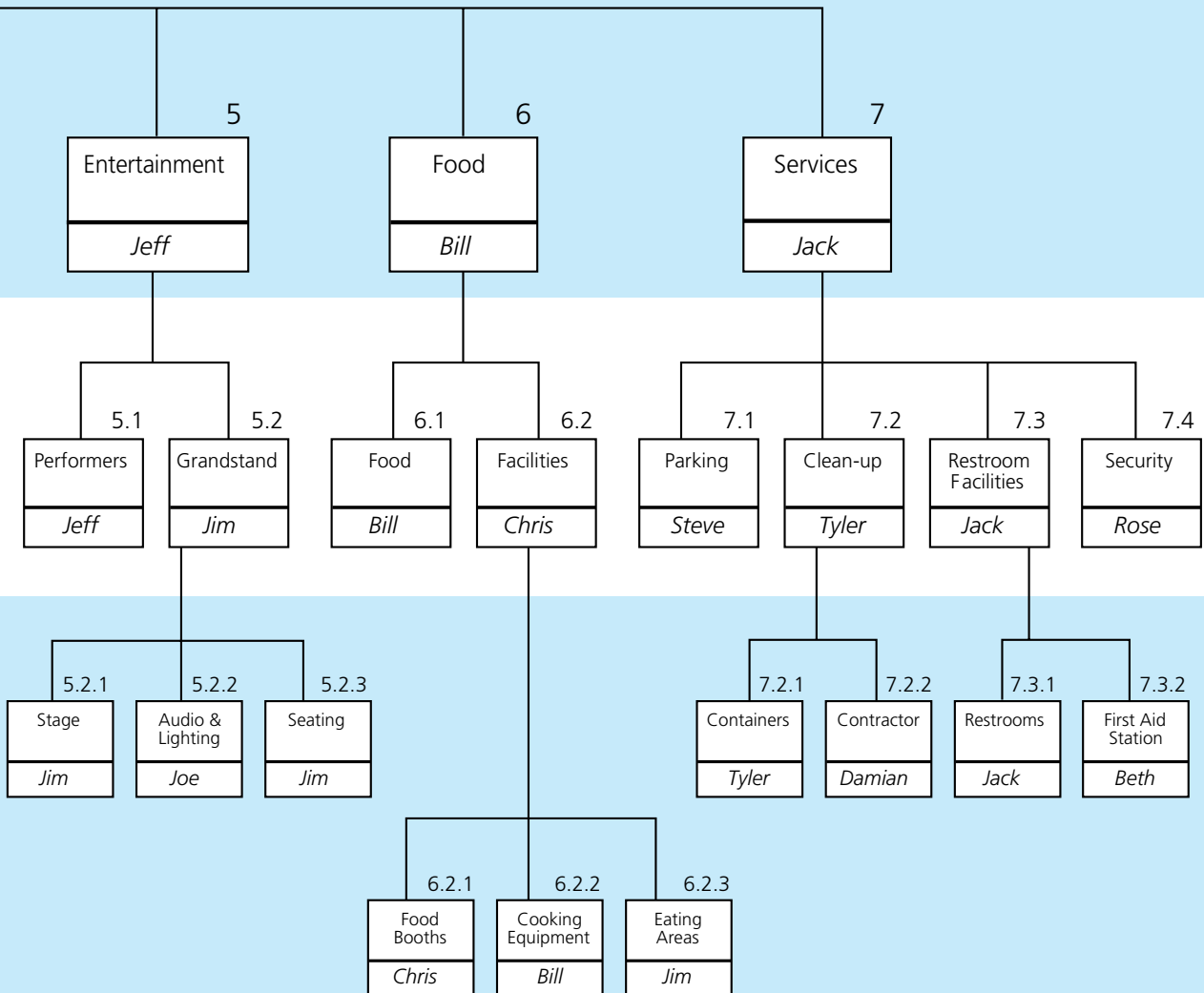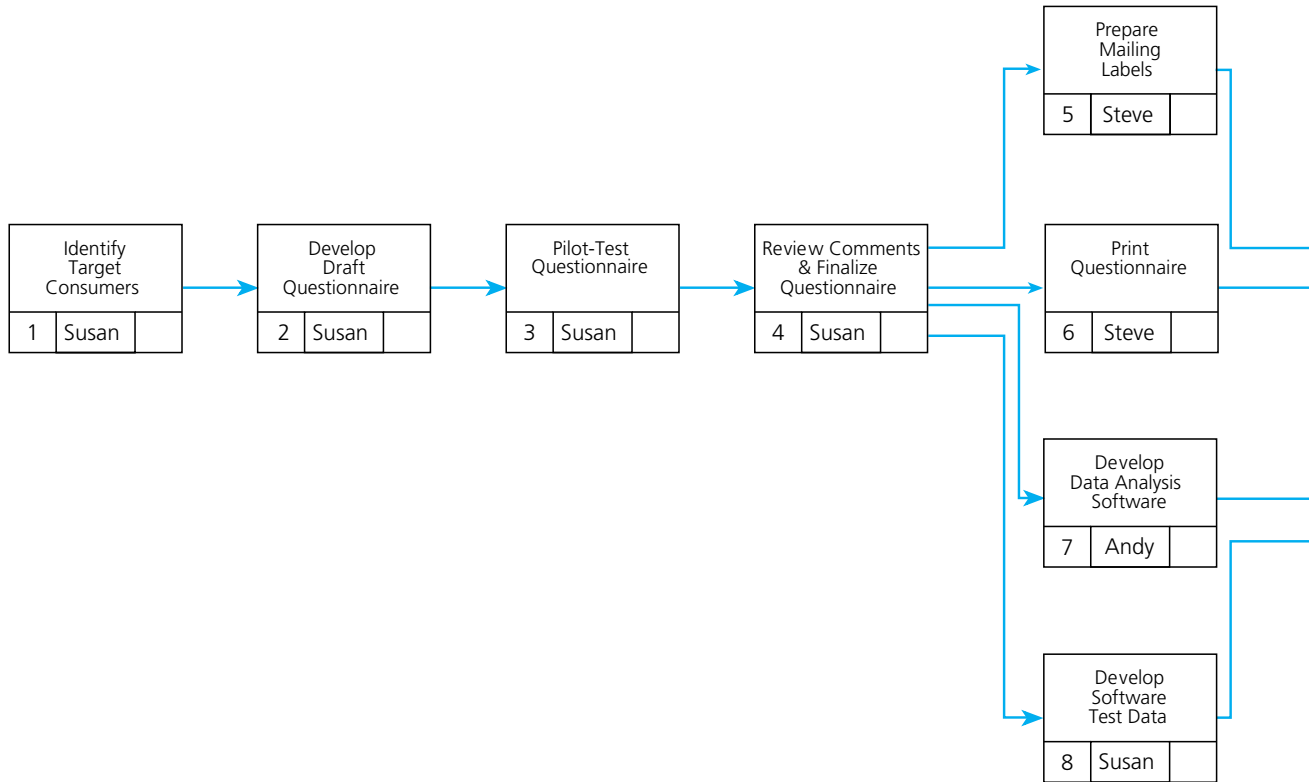   grams will be discussed further in Chapter 5.)

	5		6		7	
	Entertainment		**Food**		**Services**	
	Jeff		*Bill*		*Jack*	

5.1	5.2	6.1	6.2	7.1	7.2	7.3	7.4
Performers	Grandstand	Food	Facilities	Parking	Clean-up	Restroom Facilities	Security
Jeff	*Jim*	*Bill*	*Chris*	*Steve*	*Tyler*	*Jack*	*Rose*

5.2.1	5.2.2	5.2.3		7.2.1	7.2.2	7.3.1	7.3.2
Stage	Audio & Lighting	Seating		Containers	Contractor	Restrooms	First Aid Station
Jim	*Joe*	*Jim*		*Tyler*	*Damian*	*Jack*	*Beth*

| 6.2.1	6.2.2	6.2.3
Food Booths	Cooking Equipment	Eating Areas
Chris	*Bill*	*Jim*

FIGURE 1.4   Network Diagram

5. *Make a **time estimate** for how long it will take to complete each activity.* It is also necessary to determine which types of resources and how many of each resource are needed for each activity to be completed within the estimated duration.

6. *Make a **cost estimate** for each activity.* The cost is based on the types and quantities of resources required for each activity.

7. *Calculate a project schedule and budget to determine whether the project can be completed within the required time, with the allotted funds, and with the available resources.* If not, adjustments must be made to the project scope, activity time estimates, or resource assignments until an achievable, realistic **baseline plan** (a roadmap for accomplishing the project scope on time and within budget) can be established. Figure 1.5 shows an example of a project schedule, and Figure 1.6 illustrates a project budget. (These will be covered in Chapters 6 through 9.)

Planning determines what needs to be done, who will do it, how long it will take, and how much it will cost. The result of this effort is a baseline plan. Taking the time to develop a well-thought–out plan is critical to the successful accomplishment of any project. Many projects have overrun their budgets, missed their completion dates, or only partially met their requirements because there was no viable baseline plan before the project was started.

REINFORCE YOUR LEARNING

5. The project _____ must be agreed upon by the _____ and the individual or organization who will _____ the project.
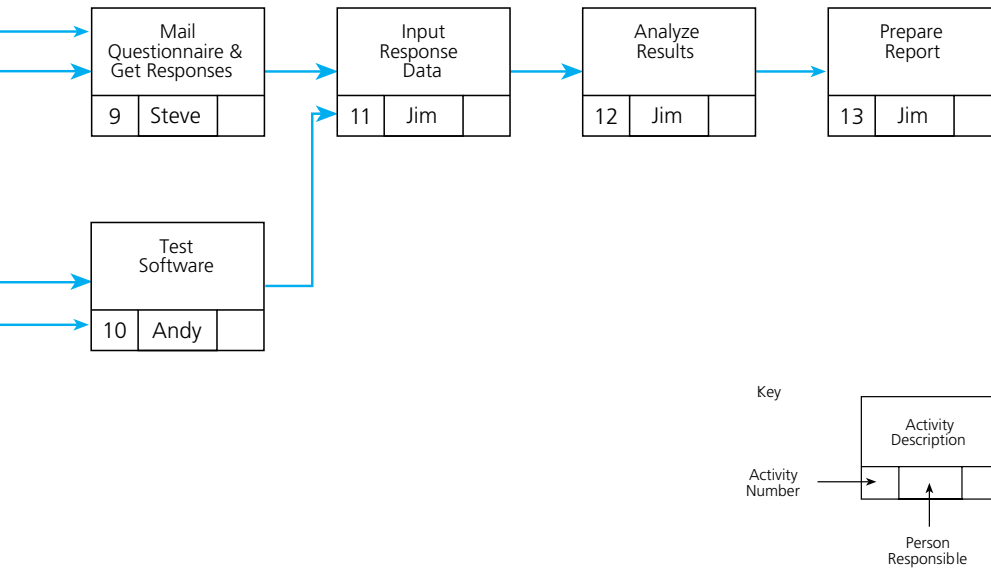
The baseline plan for a project can be displayed in graphical or tabular format for each time period (week, month) from the start of the project to its completion. (Plans are discussed and illustrated in Part 2.) Information should include

- the start and completion dates for each activity
- the amounts of the various resources that will be needed during each time period
- the budget for each time period, as well as the cumulative budget from the start of the project through each time period

Once a baseline plan has been established, it must be implemented. This involves performing the work according to the plan and controlling the work so that the project scope is achieved within the budget and schedule, to the customer's satisfaction.

Once the project starts, it is necessary to monitor progress to ensure that everything is going according to plan. At this stage, the project management process involves measuring actual progress and comparing it to planned progress. To measure actual progress, it is important to keep track of which activities have actually been started or completed, when they were started or completed, and how much money has been spent or committed. If, at any time during the project, comparison of actual progress to planned progress reveals that the

FIGURE 1.5   Project Schedule Consumer Market Study Project

Consumer Market Study Project

| #	Activity	Respon.	Dur. Estim.	Earliest Start	Earliest Finish	Latest Start	Latest Finish	Total Slack	
1	Identify Target Consumers	Susan	3	0	3	−8	−5	−8	
2	Develop Draft Questionnaire	Susan	10	3	13	−5	5	−8	
3	Pilot-Test Questionnaire	Susan	20	13	33	5	25	−8	
4	Review Comments & Finalize Questionnaire	Susan	5	33	38	25	30	−8	
5	Prepare Mailing Labels	Steve	2	38	40	38	40	0	
6	Print Questionnaire	Steve	10	38	48	30	40	−8	
7	Develop Data Analysis Software	Andy	12	38	50	88	100	50	
8	Develop Software Test Data	Susan	2	38	40	98	100	60	
9	Mail Questionnaire & Get Responses	Steve	65	48	113	40	105	−8	
10	Test Software	Andy	5	50	55	100	105	50	
11	Input Response Data	Jim	7	113	120	105	112	−8	
12	Analyze Results	Jim	8	120	128	112	120	−8	
13	Prepare Report	Jim	10	128	138	120	130	−8	

project is behind schedule, overrunning the budget, or not meeting the technical specifications, corrective action must be taken to get the project back on track.

Before a decision is made to implement corrective action, it may be necessary to evaluate several alternative actions to make sure the corrective action will bring the project back within the scope, time, and budget constraints of the objective. Be aware, for instance, that adding resources to make up time and get back on schedule may result in overrunning the planned budget. If a project gets too far out of control, it may be difficult to achieve the project objective without sacrificing the scope, budget, schedule, or quality.

The key to effective project control is measuring actual progress and comparing it to planned progress on a timely and regular basis and taking corrective action immediately, if necessary. Hoping that a problem will go away without corrective intervention is naive. Based on actual progress, it is possible to forecast a schedule and budget for completion of the project. If these parameters are beyond the limits of the project objective, corrective actions need to be implemented at once.

FIGURE 1.6   Cumulative Budgeted Cost Curve

Cumulative Budgeted Cost ($ in thousands)

Cumulative Budgeted Cost
($ in thousands)
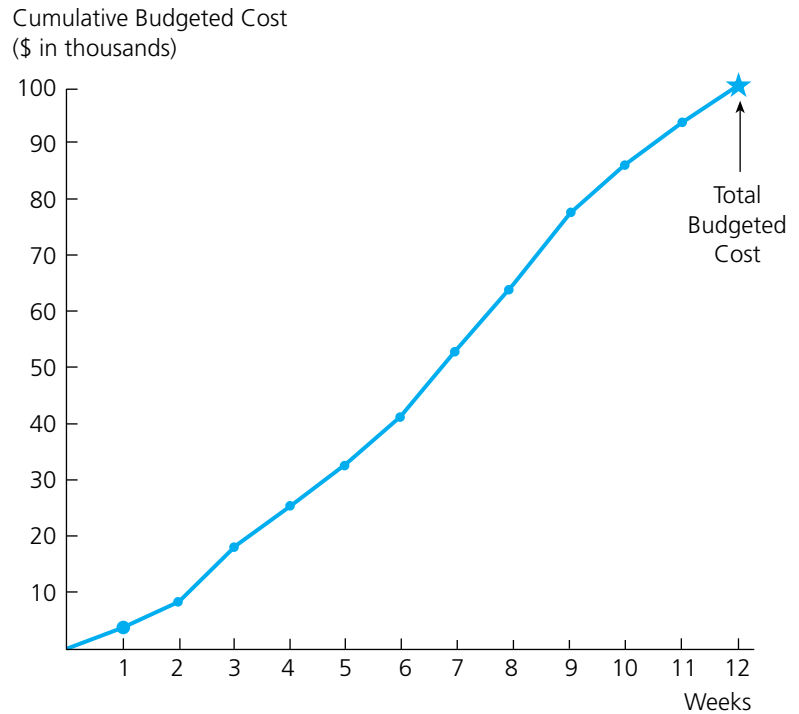
Attempting to perform a project without first establishing a baseline plan is foolhardy. It is like starting a vacation without a roadmap, itinerary, and budget. You may land up in the middle of nowhere—out of money and out of time!

BENEFITS OF PROJECT MANAGEMENT

The ultimate benefit of implementing project management techniques is having a *satisfied customer*—whether you are the customer of your own project, such as remodeling your basement, or a business (contractor) being paid by a customer to perform a project. Completing the full project scope in a quality manner, on time, and within budget provides a great feeling of satisfaction. For a contractor, it could lead to additional business from the same customer in the future or to business from new customers referred by previously satisfied customers.

"Hey! Great for the customer, but what about me? What's in it for me?" If you are the project manager, you have the satisfaction of knowing you led a successful project effort. You also have enhanced your reputation as a project manager and positioned yourself for expanded career opportunities. If you are a member of a project team

CRITICAL SUCCESS FACTORS

- Planning and communication are critical to successful project management. They prevent problems from occurring or minimize their impact on the achievement of the project objective when they do occur.
- Taking the time to develop a well-thought-out plan before the start of the project is critical to the successful accomplishment of any project.
- A project must have a well-defined objective—an expected result or product, defined in terms of scope, schedule, and cost, and agreed upon by the customer.
- Involve the customer as a partner in the successful outcome of the project through active participation during the project.
- Achieving customer satisfaction requires ongoing communication with the customer to keep the customer informed and to determine whether expectations have changed.
- The key to effective project control is measuring actual progress and comparing it to planned progress on a timely and regular basis and taking corrective action immediately, if necessary.
- After the conclusion of a project, the project performance should be evaluated to learn what could be improved if a similar project were to be done in the future. Feedback should be obtained from the customer and the project team.

that successfully accomplished a project, you feel the satisfaction of being on a winning team. You not only contributed to the project's success, but also probably expanded your knowledge and enhanced your skills along the way. If you choose to remain an individual contributor, you will be able to make a greater contribution to future, more complicated projects. If you are interested in eventually managing projects, you will be in a position to take on additional project responsibilities.

When projects are successful, everybody wins!

SUMMARY

A project is an endeavor to accomplish a specific objective through a unique set of interrelated tasks and the effective utilization of resources. It has a clearly defined objective stated in terms of scope, schedule, and cost. The responsibility of the project manager is to make sure that the project objective is accomplished and that the work scope is completed in a quality manner, within budget, and on time, to the customer's satisfaction.

The first phase of the project life cycle involves the identification of a need, problem, or opportunity and can result in the customer's requesting proposals from individuals, a project team, or organizations (contractors) to address an identified need or solve a problem. The second phase of the project life cycle is the development of a proposed solution to the need or problem. This phase results in the submission of a proposal to the customer by one or more individuals or contractors or the project team. The third phase of the project life cycle is the

implementation of the proposed solution. This phase, which is referred to as performing the project, results in accomplishment of the project objective, leaving the customer satisfied that the work scope was completed in a quality manner, within budget, and on time. The final phase of the project life cycle is terminating the project, which includes evaluating the execution of the project in order to enhance work on future projects.

Project management involves a process of first establishing a plan and then implementing that plan to accomplish the project objective. This planning effort includes clearly defining objectives, dividing and subdividing the project scope into major "pieces" called work packages, defining the specific activities that need to be performed for each work package, graphically portraying the activities in the form of a network diagram, estimating how long each activity will take to complete, defining the types of resources and how many of each resource are needed for each activity, estimating the cost of each activity, and calculating a project schedule and budget.

Taking the time to develop a well-thought-out plan is critical to the successful accomplishment of any project. Once the project starts, project management involves monitoring the progress to ensure that everything is going according to plan. The key to effective project control is measuring actual progress and comparing it to planned progress on a timely and regular basis and taking corrective action immediately, if necessary.

The ultimate benefit of implementing project management techniques is having a satisfied customer—whether you are the customer of your own project or a business (contractor) being paid by a customer to perform a project. Completing the full project scope in a quality manner, on time, and within budget provides a great feeling of satisfaction to everyone involved in the project.

QUESTIONS

1. Define *project*.
2. Define the term *project objective* and give some examples.
3. List some examples of resources that are used on a project.
4. What role does a customer have during the project life cycle?
5. What aspects of a project might involve some degree of uncertainty? Why?
6. Define *scope, schedule, cost,* and *customer satisfaction*. Why are these considered to be constraints?
7. Why is it important to satisfy the customer?
8. List and describe the main phases of the project life cycle.
9. List and describe the steps required to develop a baseline plan.
10. Why must a manager monitor the progress of a project? What can be done if a project is not proceeding according to plan?
11. List some benefits of using project management techniques.
12. Consider a project in which you are currently involved or in which you have recently been involved.
    a. Describe the objectives, scope, schedule, cost, and any assumptions made.

   b. Where are you in the project life cycle?
   c. Does this project have a baseline plan? If yes, describe it. If not, create it.
   d. Are you or is anyone else monitoring the progress of the project? If so, how? If not, how could you do so?
   e. Describe some unexpected circumstances that could jeopardize the success of the project.
   f. Describe the anticipated benefits of the project.

WORLD WIDE WEB EXERCISES

If you have difficulty accessing any of the web addresses listed here, you can find these exercises (with up-to-date addresses) at **www.towson.edu/~clements.**

1. Using your favorite web search engine (Yahoo, AskJeeves, Google, GoTo, Lycos, Excite, etc.), do a search for "project management." Explore at least five of the links that your search produces. Give the web address for each site and describe what it contains.

2. Do several additional web searches by adding, after the words "project management," some of the key words listed in this chapter. For example, search for "project management objectives," "project management life cycle," "project management process," "project management work breakdown structures," and so on. What did you find?

3. Since it was founded in 1969, the Project Management Institute (PMI) has grown to over 85,000 members worldwide. The Pennsylvania–based PMI is, by far, the leading nonprofit professional association in the area of project management. It establishes standards, sponsors seminars, develops educational programs, has a professional certification program, and publishes *Project Management Journal* and *PM Network*. It also has an excellent website for project management located at **http://www.pmi.org.** Check out the information regarding memberships, certification, education, and publications. Describe the benefits of having a membership. Apply for membership online if you are interested (student rates are available).

4. PMI chapters exist worldwide. Explore the link for your local PMI chapter. Note the members and the business organization each member represents. Follow links to websites for other PMI chapters.

5. Explore the links to PM Network Online and PMI Today Online, two excellent sources of project management information published by PMI. Select an article that interests you, locate it in the library or online, and provide a one–page summary.

CASE STUDY #1   *A Not-for-Profit Organization*

The board of directors of a local not-for-profit organization that collects and buys food and distributes it to people in need is having its February board meeting. Sitting in the conference room are Beth

Smith, the board chairperson, and two board members, Rosemary Olsen and Steve Andrews. Beth announces, "Our funds are almost exhausted. The demands on the food bank and soup kitchen have been increasing. We need to figure out how to get more funds."

"We have to have a fund-raising project," responds Rosemary.

Steve suggests, "Can't we ask the county government if they can increase their allocation to us?"

"They're strained. They may even cut our allocation next year," replies Beth.

"How much do we need to get us through this year?" asks Rosemary.

"About $10,000," answers Beth, "and we are going to start needing that money in about two months."

"We need a lot of things besides money. We need more volunteers, more space for storage, and another refrigerator for the kitchen," says Steve.

"Well, I guess we can make that all part of the fund-raising project. This is going to be fun!" says Rosemary excitedly.

"This project is growing. We'll never get it done in time," Beth says.

Rosemary responds, "We'll figure it out and get it done. We always do."

"Is a project what we need? What are we going to do next year—another project?" asks Steve. "Besides, we're having a hard time getting volunteers anyway. Maybe we need to think about how we can operate with less funds. For example, how can we get more food donations on a regular basis so we won't have to buy as much food?"

Rosemary jumps in. "Great idea! You can work on that while we also try to raise funds. We can't leave any stone unturned."

"Time out," says Beth. "These are all very good ideas, but we have limited funds and volunteers and a growing demand. We need to do something now to make sure we don't have to close our doors in two months. I think we all agree we need to undertake some type of initiative. But I'm not sure we all agree on the objective."

CASE QUESTIONS

1. What are the needs that have been identified?
2. What is the project objective?
3. What assumptions, if any, should be made regarding the project to be undertaken?
4. What are the risks involved in the project?

GROUP ACTIVITY

Contact a local not-for-profit organization in your community. Tell them that you are interested in learning about their operations. Ask them to describe a project that they are currently working on. What are the objectives? The constraints? The resources?

If possible, have your team contribute a few hours to the project. Through this process you will be helping someone in need and

learning about a real-world project at the same time. Prepare a report summarizing the project and what you learned from this experience.

CASE STUDY #2   *E-Commerce for a Small Supermarket*

Matt and Grace own a small supermarket in a rural town with a large and growing elderly population. Because of their remote location, they don't have any competition from the large chain stores. A small private liberal arts college, with about 1,500 students, is also located in the town.

"I think we need a website for our store," Matt tells Grace.

"Why?" asks Grace.

"Everybody has one. It's the wave of the future," responds Matt.

"I'm still not clear, Matt. What would be on our website?" Grace asks.

"Well, for one thing we could have a picture of our market with me and you standing in front of it," says Matt.

"What else?" asks Grace.

Matt answers, "Ah, maybe people could look up stuff and order it through the website. Yeah, those college kids would think that's great; they're into using computers all the time. That will increase our business. They'll buy food from our store rather than the pizza and burgers they always eat or get delivered from Sam's Sub Shop. And those people who live in the senior citizens apartments would use it too. I heard they're teaching them how to use computers. And maybe we can even set up a delivery service."

"Hold on," says Grace. "Those college students get pizza and subs from Sam's at all hours of the night. Long after we're closed. And I think the senior citizens enjoy getting out. They have a van that brings some of them here each day to shop; and they really don't buy much anyway. And how will they pay for what they order through the website? I'm all for keeping up with things, but I'm not sure this makes sense for our little supermarket, Matt. What would we be trying to accomplish with a website?"

"I just explained it to you, Grace. It's the way all businesses are going. We either keep up with things or we'll be out of business," replies Matt.

"Does this have anything to do with that Chamber of Commerce meeting you went to in Big Falls last week, where you said they had some consultant talking about e-business or something?" asks Grace.

"Yeah, maybe," Matt says. "I think I'll give him a call and tell him to stop by and tell him what I want."

"How much is all this going to cost us, Matt?" asks Grace. "I think we need to think about this some more. You know we are probably going to have to pave the parking lot this summer."

Matt answers, "Don't worry. It'll all work out. Trust me. Our business will increase so much, it'll pay for itself in no time. Besides, it can't cost that much; this consultant probably does these kinds of projects all the time."

CASE QUESTIONS

1. What are the needs that have been identified?
2. What is the project objective?
3. What are some things Matt and Grace should do before they talk with the consultant?
4. What should the consultant tell Matt and Grace?

GROUP ACTIVITY

Select two course participants to use this case script to role-play Matt and Grace in front of the class. Then divide the course participants into groups of three or four to discuss the case questions. Each group must choose a spokesperson to present its responses to the entire class.

OPTIONAL ACTIVITY

Have each course participant contact a business that went "online" and ask the business what led it to that decision and if the project met its initial expectations.