See the nearby Snapshot from Practice 1.2 for examples of projects given to recent college graduates. The logical starting point for developing these skills is understanding the uniqueness of a project and of project managers.

1.1 What Is a Project?

LO 1-2

Distinguish a project from routine operations.

What do the following headlines have in common?

Millions watch Olympic Opening Ceremony
Citywide WiFi System Set to Go Live
Hospitals Respond to New Healthcare Reforms
Apple's New iPhone Hits the Market
City Receives Stimulus Funds to Expand Light Rail System

All of these events represent projects.

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The Project Management Institute provides the following definition of a project:

A **project** is a temporary endeavor undertaken to create a unique product, service, or result.

Like most organizational efforts, the major goal of a project is to satisfy a customer's need. Beyond this fundamental similarity, the characteristics of a project help

differentiate it from other endeavors of the organization. The major characteristics of a project are as follows:

1. An established objective.
2. A defined life span with a beginning and an end.
3. Usually, the involvement of several departments and professionals.
4. Typically, doing something that has never been done before.
5. Specific time, cost, and performance requirements.

First, projects have a defined objective—whether it is constructing a 12-story apartment complex by January 1 or releasing version 2.0 of a specific software package as quickly as possible. This singular purpose is often lacking in daily organizational life in which workers perform repetitive operations each day.

Second, because there is a specified objective, projects have a defined endpoint, which is contrary to the ongoing duties and responsibilities of traditional jobs. In many cases, individuals move from one project to the next as opposed to staying in one job. After helping to install a security system, an IT engineer may be assigned to develop a database for a different client.

Third, unlike much organizational work that is segmented according to functional specialty, projects typically require the combined efforts of a variety of specialists. Instead of working in separate offices under separate managers, project participants, whether they be engineers, financial analysts, marketing professionals, or quality control specialists, work closely together under the guidance of a project manager to complete a project.

The fourth characteristic of a project is that it is nonroutine and has some unique elements. This is not an either/or issue but a matter of degree. Obviously, accomplishing something that has never been done before, such as building an electric automobile or landing two mechanical rovers on Mars, requires solving previously unsolved problems and using breakthrough technology. On the other hand, even basic construction projects that involve established sets of routines and procedures require some degree of customization that makes them unique.

Finally, specific time, cost, and performance requirements bind projects. Projects are evaluated according to accomplishment, cost, and time spent. These triple constraints impose a higher degree of accountability than you typically find in most jobs. These three also highlight one of the primary functions of project management, which is balancing the trade-offs among time, cost, and performance while ultimately satisfying the customer.

What a Project Is Not

Projects should not be confused with everyday work. A project is not routine, repetitive work! Ordinary daily work typically requires doing the same or similar work over and over, while a project is done only once; a new product or service exists when the project is completed. Examine the list in Table 1.1 that compares routine, repetitive work and projects. Recognizing the difference is important because too often resources can be used up on daily operations which may not contribute to longer range organization strategies that require innovative new products.

Program versus Project

In practice the terms *project* and *program* cause confusion. They are often used synonymously. *A* **program** *is a group of related projects designed to accomplish a*

TABLE 1.1 Comparison of Routine Work with Projects

Routine, Repetitive Work	Projects
Taking class notes	Writing a term paper
Daily entering sales receipts into the accounting ledger	Setting up a sales kiosk for a professional accounting meeting
Responding to a supply-chain request	Developing a supply-chain information system
Practicing scales on the piano	Writing a new piano piece
Routine manufacture of an Apple iPod	Designing an iPod that is approximately 2 × 4 inches, interfaces with PC, and stores 10,000 songs
Attaching tags on a manufactured product	Wire-tag projects for GE and Walmart

common goal over an extended period of time. Each project within a program has a project manager. The major differences lie in scale and time span.

Program management is the process of *managing* a group of ongoing, interdependent, related *projects* in a coordinated way to achieve strategic objectives. For example, a pharmaceutical organization could have a program for curing cancer. The cancer program includes and coordinates *all* cancer projects that continue over an extended time horizon (Gray, 2011). Coordinating all cancer projects under the oversight of a cancer team provides benefits not available from managing them individually. This cancer team also oversees the selection and prioritizing of cancer projects that are included in their special "Cancer" portfolio. Although each project retains its own goals and scope, the project manager and team are also motivated by the higher program goal. Program goals are closely related to broad strategic organization goals.

The Project Life Cycle

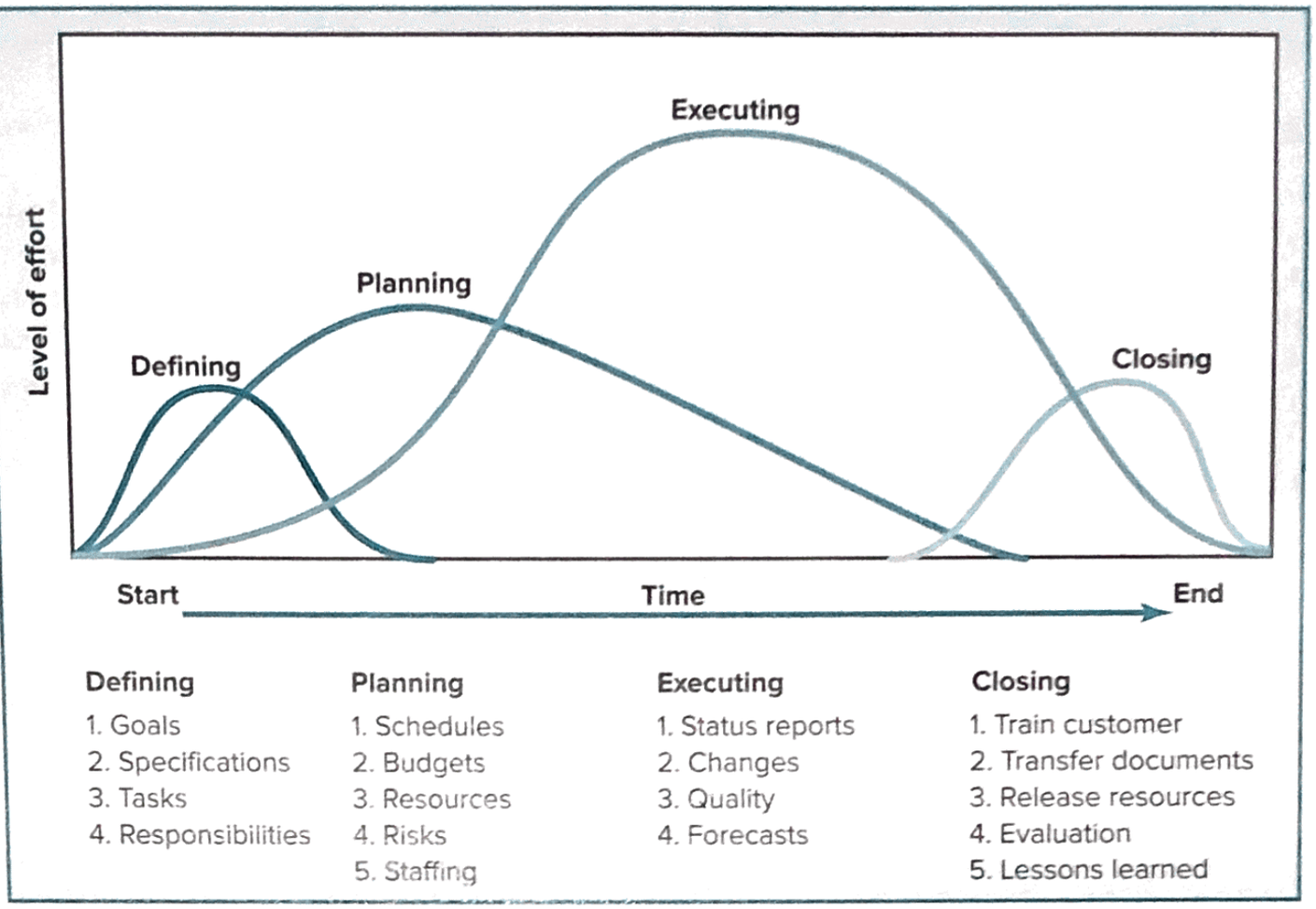
LO 1-3

Identify the different stages of project life cycle.

Another way of illustrating the unique nature of project work is in terms of the **project life cycle.** Some project managers find it useful to use the project life cycle as the cornerstone for managing projects. The life cycle recognizes that projects have a limited life span and that there are predictable changes in level of effort and focus over the life of the project. There are a number of different life-cycle models in project management literature. Many are unique to a specific industry or type of project. For example, a new software development project may consist of five phases: definition, design, code, integration/test, and maintenance. A generic cycle is depicted in Figure 1.1.

The project life cycle typically passes sequentially through four stages: defining, planning, executing, and delivering. The starting point begins the moment the project is given the go-ahead. Project effort starts slowly, builds to a peak, and then declines to delivery of the project to the customer.

1. **Defining stage:** Specifications of the project are defined; project objectives are established; teams are formed; major responsibilities are assigned.
2. **Planning stage:** The level of effort increases, and plans are developed to determine what the project will entail, when it will be scheduled, whom it will benefit, what quality level should be maintained, and what the budget will be.
3. **Executing stage:** A major portion of the project work takes place—both physical and mental. The physical product is produced (a bridge, a report, a software program). Time, cost, and specification measures are used for control. Is the project on schedule, on budget, and meeting specifications? What are the forecasts of each of these measures? What revisions/changes are necessary?
4. **Closing stage:** Closing includes three activities: delivering the project product to the customer, redeploying project resources, and post-project review. Delivery of



the project might include customer training and transferring documents. Redeployment usually involves releasing project equipment/materials to other projects and finding new assignments for team members. Post-project reviews include not only assessing performance but also capturing lessons learned.

In practice, the project life cycle is used by some project groups to depict the timing of major tasks over the life of the project. For example, the design team might plan a major commitment of resources in the defining stage, while the quality team would expect their major effort to increase in the latter stages of the project life cycle. Because most organizations have a portfolio of projects going on concurrently, each at a different stage of each project's life cycle, careful planning and management at the organization and project levels are imperative.

The Project Manager

At first glance project managers perform the same functions as other managers. That is, they plan, schedule, motivate, and control. However, what makes them unique is that they manage temporary, nonrepetitive activities, to complete a fixed life project. Unlike functional managers, who take over existing operations, project managers create a project team and organization where none existed before. They must decide what and how things should be done instead of simply managing set processes. They must meet the challenges of each phase of the project life cycle, and even oversee the dissolution of their operation when the project is completed.

Project managers must work with a diverse troupe of characters to complete projects. They are typically the direct link to the customer and must manage the tension between customer expectations and what is feasible and reasonable. Project managers provide direction, coordination, and integration to the project team, which is often made up of part-time participants loyal to their functional departments. They often must work with a cadre of outsiders—vendors, suppliers, subcontractors—who do not necessarily share their project allegience.