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Systems Planning and Selection

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Chapter Objectives

After studying this chapter, you should be able to:

- Describe the steps involved when identifying and selecting projects and initiating and planning projects.
- Explain the need for and the contents of a project scope statement and baseline project plan.
- List and describe various methods for assessing project feasibility.
- Describe the differences between tangible and intangible benefits and costs, and the differences between one-time and recurring costs.
- Perform cost-benefit analysis and describe what is meant by the time value of money, present value, discount rate, net present value, return on investment, and break-even analysis.
- Describe the activities and participant roles within a structured walkthrough.

Chapter Preview . . .

The acquisition, development, and maintenance of information systems consume substantial resources for most organizations. Organizations can benefit from following a formal process for identifying, selecting, initiating, and planning projects. The first phase of the systems development life cycle—systems planning and selection—deals with this issue. As you can see in Figure 4-1, this phase consists of two primary activities. In the next section, you learn about the first activity, a general method for identifying and selecting projects and the deliverables and outcomes from this process. Next, we review the second activity, project initiation and planning, and present several techniques for assessing project feasibility. The information uncovered during feasibility analysis is organized into a document called a baseline project plan. The process of building this plan is discussed next. Before the project can evolve to the next phase of the systems development life cycle—systems analysis—the project plan must be reviewed and accepted. In the final major section of the chapter, we provide an overview of the project review process.

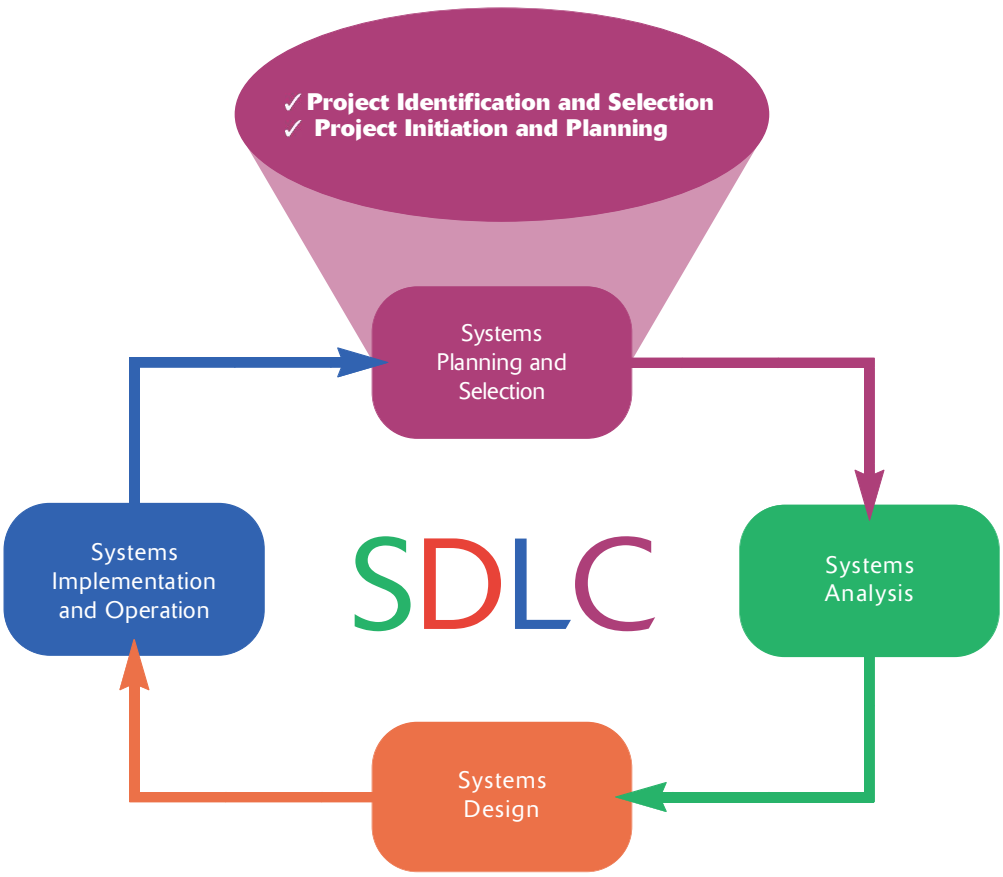


FIGURE 4-1
Systems development life cycle phase 1, systems planning and selection. Phase 1 activities are project identification and selection and project initiation and planning.

Identifying and Selecting Projects

The first activity of the systems planning and selection phase of the SDLC is project identification and selection. During this activity, a senior manager, a business group, an IS manager, or a steering committee identifies and assesses all possible systems development projects that a business unit could undertake. Next, those projects deemed most likely to yield significant organizational benefits, given available resources, are selected. Organizations vary in their approach to identifying and selecting projects. In some organizations, project identification and selection is a formal process in which projects are outcomes of a larger overall planning process. For example, a large organization may follow a formal project identification process that involves rigorously comparing all competing projects. Alternatively, a small organization may use informal project selection processes that allow the highest-ranking IS manager to select projects independently or allow individual business units to decide on projects after agreeing on funding.

Requests for information systems development can come from three key sources, as depicted in Figure 4-2:

1. Managers and business units who want to replace or extend an existing system in order to gain needed information or to provide a new service to customers
2. Information systems managers who want to make a system more efficient, less costly to operate, or want to move a system to a new operating environment
3. Formal planning groups that want to improve an existing system in order to help the organization meet its corporate objectives, such as providing better customer service

Regardless of how an organization executes the project identification and selection process, a common sequence of activities occurs. In the following sections, we describe a general process for identifying and selecting projects, and producing the deliverables and outcomes of this process.

The Process of Identifying and Selecting Information Systems Development Projects

Project identification and selection consists of three primary activities: identifying potential development projects, classifying and ranking projects, and selecting projects for development. Each of these activities is described next.

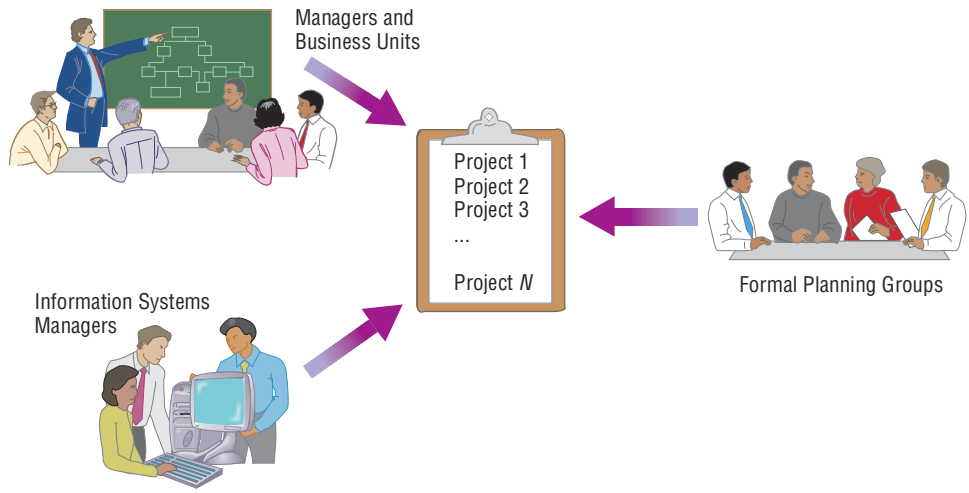


FIGURE 4-2
Three key sources for information systems projects.

1. *Identifying potential development projects.* Organizations vary as to how they identify projects. This process can be performed by:
   - A key member of top management, either the CEO of a small or medium-size organization or a senior executive in a larger organization
   - A steering committee, composed of a cross section of managers with an interest in systems
   - User departments, in which either the head of the requesting unit or a committee from the requesting department decides which projects to submit (as a systems analyst, you will help users prepare such requests)
   - The development group or a senior IS manager

   Each identification method has strengths and weaknesses. For example, projects identified by top management have a strategic organizational focus. Alternatively, projects identified by steering committees reflect the diversity of the committee and therefore have a cross-functional focus. Projects identified by individual departments or business units have a narrow, tactical focus. The development group identifies projects based on the ease with which existing hardware and systems will integrate with the proposed project. Other factors, such as project cost, duration, complexity, and risk, also influence the people who identify a project. Table 4-1 summarizes the characteristics of each selection method.

   Of all the possible project sources, those identified by top management and steering committees most often reflect the broader needs of the organization. These groups have a better understanding of overall business objectives and constraints. Projects identified by top management or by a diverse steering committee are therefore referred to as coming from a top-down source.

   Projects identified by a functional manager, a business unit, or the information systems development group are often designed for a particular business need within a given business unit and may not reflect the overall objectives of the organization. It's not that projects identified by individual managers, business units, or the IS development group are deficient, but rather that they may not consider broader organizational issues. Project initiatives stemming from managers, business units, or the development group are referred to as coming from a bottom-up source. As a systems analyst, you provide ongoing support for users of these types of projects and are involved early in the life cycle. You help managers describe their information needs and the reasons for doing the project. These descriptions are evaluated in selecting which projects will be approved to move into the project initiation and planning activities.

   In sum, projects are identified by both top-down and bottom-up initiatives. The formality of identifying and selecting projects can vary substantially across organizations. Because limited resources preclude the

TABLE 4-1: Common Characteristics of Alternative Methods for Making Information Systems Identification and Selection Decisions

Project Source	Cost	Duration	Complexity	System Size	Focus
Top management	Highest	Longest	Highest	Largest	Strategic
Steering committee	High	Long	High	Large	Cross-functional
User department	Low	Short	Low	Small	Departmental
Development group	Low–high	Short–long	Low–high	Small–large	Integration with existing systems

development of all proposed systems, most organizations have some process of classifying and ranking each project's merit. Those projects deemed to be inconsistent with overall organizational objectives, redundant in functionality to some existing system, or unnecessary will not be considered.

2. *Classifying and ranking IS development projects.* Assessing the merit of potential projects is the second major activity in the project identification and selection phase. As with project identification, classifying and ranking projects can be performed by top managers, a steering committee, business units, or the IS development group. The criteria used to assign the merit of a given project can vary based on the size of the organization. Table 4-2 summarizes the criteria commonly used to evaluate projects. In any given organization, one or several criteria might be used during the classifying and ranking process.

   As with project identification, the criteria used to evaluate projects will vary by organization. If, for example, an organization uses a steering committee, it may choose to meet monthly or quarterly to review projects and use a wide variety of evaluation criteria. At these meetings, new project requests are reviewed relative to projects already identified, and ongoing projects are monitored. The relative ratings of projects are used to guide the final activity of this identification process—project selection.

3. *Selecting IS development projects.* The selection of projects is the final activity in the project identification and selection phase. The short- and long-term projects most likely to achieve business objectives are considered. As business conditions change over time, the relative importance of any single project may substantially change. Thus, the identification and selection of projects is an important and ongoing activity.

   Numerous factors must be considered when selecting a project, as illustrated in Figure 4-3. These factors include:

   - Perceived needs of the organization
   - Existing systems and ongoing projects
   - Resource availability
   - Evaluation criteria
   - Current business conditions
   - Perspectives of the decision makers

TABLE 4-2: Possible Evaluation Criteria When Classifying and Ranking Projects

Evaluation Criteria	Description
Value chain analysis	Extent to which activities add value and costs when developing products and/or services; information systems projects providing the greatest overall benefits will be given priority over those with fewer benefits
Strategic alignment	Extent to which the project is viewed as helping the organization achieve its strategic objectives and long-term goals
Potential benefits	Extent to which the project is viewed as improving profits, customer service, etc., and the duration of these benefits
Resource availability	Amount and type of resources the project requires and their availability
Project size/duration	Number of individuals and the length of time needed to complete the project
Technical difficulty/risks	Level of technical difficulty to complete the project successfully within given time and resource constraints

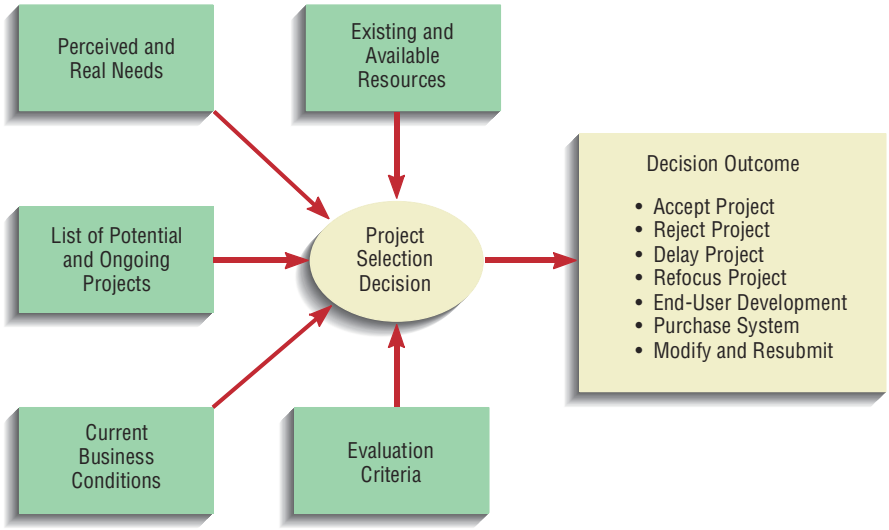


FIGURE 4-3
Numerous factors must be considered when selecting a project. Decisions can result in one of seven outcomes.

This decision-making process can lead to numerous outcomes. Of course, projects can be accepted or rejected. Acceptance of a project usually means that funding to conduct the next SDLC activity has been approved. Rejection means that the project will no longer be considered for development. However, projects may also be conditionally accepted; projects may be accepted pending the approval or availability of needed resources or the demonstration that a particularly difficult aspect of the system can be developed. Projects may also be returned to the original requesters who are told to develop or purchase the requested system themselves. Finally, the requesters of a project may be asked to modify and resubmit their request after making suggested changes or clarifications.

Deliverables and Outcomes

The primary deliverable, or end product, from the project identification and selection phase is a schedule of specific IS development projects. These projects come from both top-down and bottom-up sources, and once selected they move into the second activity within this SDLC phase—project initiation and planning. This sequence of events is illustrated in Figure 4-4. An outcome of this activity is the assurance that people in the organization gave careful

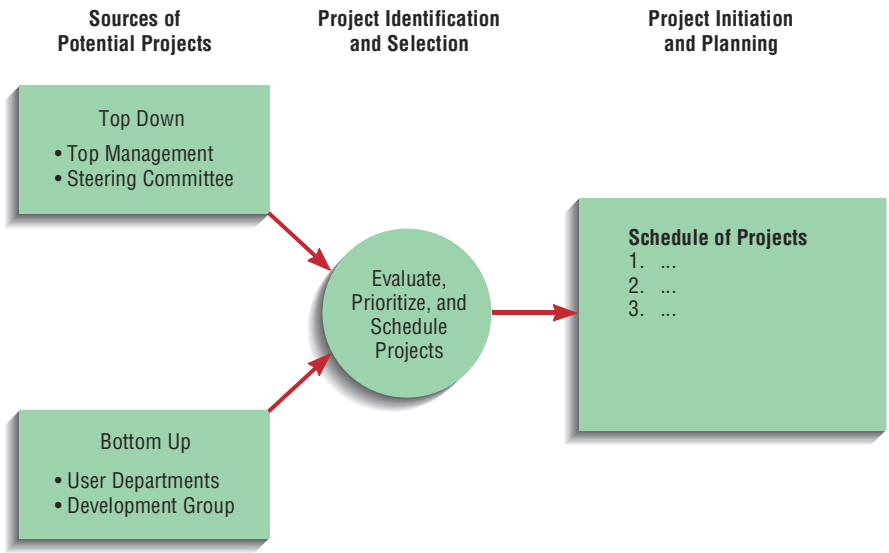


FIGURE 4-4
Information systems development projects come from both top-down and bottom-up initiatives.

consideration to project selection and clearly understood how each project could help the organization reach its objectives. Because of the principle of incremental commitment, a selected project does not necessarily result in a working system. **Incremental commitment** means that after each subsequent SDLC activity, you, other members of the project team, and organization officials will reassess your project. This reassessment will determine whether the business conditions have changed or whether a more detailed understanding of a system's costs, benefits, and risks would suggest that the project is not as worthy as previously thought. In the next section, we discuss several techniques for gaining a thorough understanding of your development project.

Incremental commitment
A strategy in systems analysis and design in which the project is reviewed after each phase, and continuation of the project is rejustified in each of these reviews.

Initiating and Planning Systems Development Projects

Many activities performed during initiation and planning could also be completed during the next phase of the SDLC—systems analysis. Proper and insightful project initiation and planning, including determining project scope and identifying project activities, can reduce the time needed to complete later project phases, including systems analysis. For example, a careful feasibility analysis conducted during initiation and planning could lead to rejecting a project and saving a considerable expenditure of resources. The actual amount of time expended will be affected by the size and complexity of the project as well as by the experience of your organization in building similar systems. A rule of thumb is that between 10 and 20 percent of the entire development effort should be expended on initiation and planning. In other words, you should not be reluctant to spend considerable time and energy early in the project's life in order to fully understand the motivation for the requested system.

Most organizations assign an experienced systems analyst, or team of analysts for large projects, to perform project initiation and planning. The analyst will work with the proposed customers—managers and users in a business unit—of the system and other technical development staff in preparing the final plan. Experienced analysts working with customers who well understand their information services needs should be able to perform a detailed analysis with relatively little effort. Less experienced analysts with customers who only vaguely understand their needs will likely expend more effort in order to be certain that the project scope and work plan are feasible.

The objective of project initiation and planning is to transform a vague system request document into a tangible project description, as illustrated in Figure 4-5. Effective communication among the systems analysts, users, and management is crucial to the creation of a meaningful project plan. Getting all parties to agree on the direction of a project may be difficult for cross-department projects when different parties have different business objectives. Projects at large, complex organizations require systems analysts to take more time to analyze both the current and proposed systems.

In the remainder of this chapter, we describe how a systems analyst develops a clear project description.

The Process of Initiating and Planning Systems Development Projects

As its name implies, two major activities occur during project initiation and project planning. Project initiation focuses on activities that will help organize a team to conduct project planning. During initiation, one or more analysts are assigned to work with a customer to establish work standards and communication procedures. Table 4-3 summarizes six activities performed during project initiation.

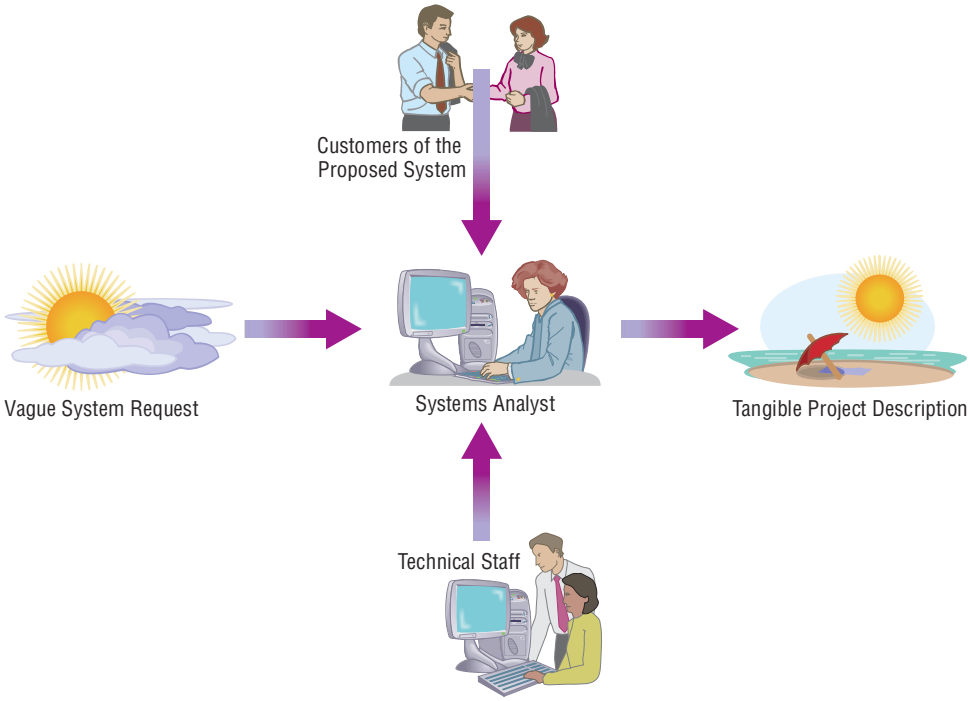


FIGURE 4-5
The systems analyst transforms a vague systems request into a tangible project description during project initiation and planning.

The second activity, project planning, focuses on defining clear, discrete tasks and the work needed to complete each task. The objective of the project planning process is to produce two documents: a *baseline project plan* (BPP) and the *project scope statement* (PSS). The BPP becomes the foundation for the remainder of the development project. It is an internal document used by the development team but not shared with customers. The PSS, produced by the project team, clearly outlines the objectives of the project for the customer. As with the project initiation process, the size, scope, and complexity of a project dictate the comprehensiveness of the project planning process and the resulting documents. Further, numerous assumptions about resource availability and potential problems will have to be made. Analysis of these assumptions and system costs and benefits forms a **business case.** Table 4-4 lists the activities performed during project planning.

Business case
A written report that outlines the justification for an information system. The report highlights economic benefits and costs and the technical and organizational feasibility of the proposed system.

Deliverables and Outcomes

The major outcomes and deliverables from project initiation and planning are the baseline project plan and the project scope statement. The **baseline project plan (BPP)** contains all information collected and analyzed during the project initiation and planning activity. The plan contains the best estimate of the project's

Baseline project plan (BPP)
One of the major outcomes and deliverables from the project initiation and planning phase. It contains the best estimate of the project's scope, benefits, costs, risks, and resource requirements.

TABLE 4-3: Types of Activities Performed during Project Initiation

- Establishing the project initiation team
- Establishing a relationship with the customer
- Establishing the project initiation plan
- Establishing management procedures
- Establishing the project management environment and project workbook
- Developing the project charter

TABLE 4-4: Activities Performed during Project Planning

- Describing the project scope, alternatives, and feasibility
- Dividing the project into manageable tasks
- Estimating resources and creating a resource plan
- Developing a preliminary schedule
- Developing a communication plan
- Determining project standards and procedures
- Identifying and assessing risk
- Creating a preliminary budget
- Developing a project scope statement
- Setting a baseline project plan

scope, benefits, costs, risks, and resource requirements given the current understanding of the project. The BPP specifies detailed project activities for the next life cycle phase—systems analysis—and provides less detail for subsequent project phases (because these depend on the results of the analysis phase). Similarly, benefits, costs, risks, and resource requirements will become more specific and quantifiable as the project progresses. The project selection committee uses the BPP to help decide whether to continue, redirect, or cancel a project. If selected, the BPP becomes the foundation document for all subsequent SDLC activities; however, it is updated as new information is learned during subsequent SDLC activities. We explain how to construct the BPP later in the chapter.

Assessing Project Feasibility

Most information systems projects have budgets and deadlines. Assessing project feasibility is a required task that can be a large undertaking because it requires you, as a systems analyst, to evaluate a wide range of factors. Although the specifics of a given project will dictate which factors are most important, most feasibility factors fall into the following six categories:

- Economic
- Operational
- Technical
- Schedule
- Legal and contractual
- Political

The analysis of these six factors forms the business case that justifies the expenditure of resources on the project. In the remainder of this section, we examine various feasibility studies, beginning with economic feasibility.

PINE VALLEY FURNITURE

To help you better understand the feasibility assessment process, we examine a project at Pine Valley Furniture. Jackie Judson, Pine Valley Furniture's (PVF) vice president of marketing, prepares a system service request (SSR), illustrated in Figure 4-6, to develop a customer tracking system. Jackie feels that this system would allow PVF's marketing group to better track customer purchase activity and sales trends. She also feels that, if implemented, the Customer Tracking System (CTS) would help improve revenue, a tangible benefit, and improve employee morale, an intangible benefit. PVF's Systems Priority Board selected this project for an initiation and planning study. The board assigned senior systems

Pine Valley Furniture
System Service Request

REQUESTED BY Jackie Judson DATE: September 1, 2012

DEPARTMENT Marketing

LOCATION Headquarters, 570c

CONTACT Tel: 4-3290 FAX: 4-3270 e-mail: jjudson@pvf.com

TYPE OF REQUEST
[X] New System
[ ] System Enhancement
[ ] System Error Correction

URGENCY
[ ] Immediate—Operations are impaired or opportunity lost
[ ] Problems exist, but can be worked around
[X] Business losses can be tolerated until new system installed

PROBLEM STATEMENT

Sales growth at PVF has caused a greater volume of work for the marketing department. This volume of work has greatly increased the volume and complexity of the data we need to deal with and understand. We are currently using manual methods and a complex PC-based electronic spreadsheet to track and forecast customer buying patterns. This method of analysis has many problems: (1) We are slow to catch buying trends as there is often a week or more delay before data can be taken from the point-of-sale system and manually entered into our spreadsheet; (2) the process of manual data entry is prone to errors (which makes the results of our subsequent analysis suspect); and (3) the volume of data and the complexity of analyses conducted in the system seem to be overwhelming our current system—sometimes the program starts recalculating and never returns anything, or it returns information that we know cannot be correct.

SERVICE REQUEST

I request a thorough analysis of our current method of tracking and analysis of customer purchasing activity with the intent to design and build a completely new information system. This system should handle all customer purchasing activity, support display and reporting of critical sales information, and assist marketing personnel in understanding the increasingly complex and competitive business environment. I feel that such a system will improve the competitiveness of PVF, particularly in our ability to better serve our customers.

IS LIAISON Jim Woo (Tel: 4-6207 FAX: 4-6200 e-mail: jwoo@pvf.com)

SPONSOR Jackie Judson, Vice President of Marketing

TO BE COMPLETED BY SYSTEMS PRIORITY BOARD

[ ] Request approved Assigned to
Start date
[ ] Recommend revision
[ ] Suggest user development
[ ] Reject for reason

FIGURE 4-6
System service request (SSR) for the Customer Tracking System at Pine Valley Furniture. The SSR includes contact information, a problem statement, service request statement, and liaison contact information.

analyst Jim Woo to work with Jackie to initiate and plan the project. At this point in the project, all project initiation activities have been completed: Jackie prepared an SSR, the selection board reviewed the SSR, and Jim Woo was assigned to work on the project. Jackie and Jim can now focus on project planning activities, which will lead to the baseline project plan.

Assessing Economic Feasibility

Economic feasibility
A process of identifying the financial benefits and costs associated with a development project.

A study of economic feasibility is required for the baseline project plan. The purpose for assessing **economic feasibility** is to identify the financial benefits and costs associated with the development project. Economic feasibility is often referred to as *cost-benefit analysis*. During project initiation and planning, it will be impossible for you to define precisely all benefits and costs related to a particular project. Yet, it is important that you identify and quantify benefits and costs, or it will be impossible for you to conduct a sound economic analysis and determine whether one project is more feasible than another. Next, we review worksheets you can use to record costs and benefits, and techniques for making cost-benefit calculations. These worksheets and techniques are used after each SDLC phase to decide whether to continue, redirect, or kill a project.

Determining Project Benefits An information system can provide many benefits to an organization. For example, a new or renovated IS can automate monotonous jobs, reduce errors, provide innovative services to customers and suppliers, and improve organizational efficiency, speed, flexibility, and morale. These benefits are both tangible and intangible. A **tangible benefit** is an item that can be measured in dollars and with certainty. Examples of tangible benefits include reduced personnel expenses, lower transaction costs, or higher profit margins. It is important to note that not all tangible benefits can be easily quantified. For example, a tangible benefit that allows a company to perform a task 50 percent of the time may be difficult to quantify in terms of hard dollar savings. Most tangible benefits fit in one or more of the following categories:

Tangible benefit
A benefit, derived from the creation of an information system, that can be measured in dollars and with certainty.

- Cost reduction and avoidance
- Error reduction
- Increased flexibility
- Increased speed of activity
- Improvement of management planning and control
- Opening new markets and increasing sales opportunities

Jim and Jackie identified several tangible benefits of the Customer Tracking System at PVF and summarized them in a worksheet, shown in Figure 4-7. Jackie and Jim collected information from users of the current customer tracking system in order to create the worksheet. They first interviewed the person responsible for collecting, entering, and analyzing the correctness of the current customer tracking data. This person estimated that he spent 10 percent of his

FIGURE 4-7
Tangible benefits worksheet for the Customer Tracking System at Pine Valley Furniture.

TANGIBLE BENEFITS WORKSHEET
Customer Tracking System Project

	Year 1 through 5
A. Cost reduction or avoidance	$ 4,500
B. Error reduction	2,500
C. Increased flexibility	7,500
D. Increased speed of activity	10,500
E. Improvement in management planning or control	25,000
F. Other _____	0
TOTAL Tangible Benefits	**$50,000**

time correcting data-entry errors. This person's salary is $25,000, so Jackie and Jim estimated an error reduction benefit of $2,500 (10 percent of $25,000). Jackie and Jim also interviewed managers who used the current customer tracking reports to estimate other tangible benefits. They learned that cost reduction or avoidance benefits could be gained with better inventory management. Also, increased flexibility would likely occur from a reduction in the time normally taken to reorganize data manually for different purposes. Further, improvements in management planning or control should result from a broader range of analyses in the new system. This analysis forecasts that benefits from the system would be approximately $50,000 per year.

Jim and Jackie also identified several intangible benefits of the system. Although they could not quantify these benefits, they will still be described in the final BPP. **Intangible benefits** refer to items that cannot be easily measured in dollars or with certainty. Intangible benefits may have direct organizational benefits, such as the improvement of employee morale, or they may have broader societal implications, such as the reduction of waste creation or resource consumption. Potential tangible benefits may have to be considered intangible during project initiation and planning because you may not be able to quantify them in dollars or with certainty at this stage in the life cycle. During later stages, such intangibles can become tangible benefits as you better understand the ramifications of the system you are designing. Intangible benefits include:

Intangible benefit
A benefit derived from the creation of an information system, that cannot be easily measured in dollars or with certainty.

- Competitive necessity
- Increased organizational flexibility
- Increased employee morale
- Promotion of organizational learning and understanding
- More timely information

After determining project benefits, project costs must be identified.

Determining Project Costs An information system can have both tangible and intangible costs. A **tangible cost** refers to an item that you can easily measure in dollars and with certainty. From a systems development perspective, tangible costs include items such as hardware costs, labor costs, and operational costs from employee training and building renovations. Alternatively, an **intangible cost** refers to an item that you cannot easily measure in terms of dollars or with certainty. Intangible costs can include loss of customer goodwill, employee morale, or operational inefficiency.

Tangible cost
A cost associated with an information system that can be easily measured in dollars and with certainty.

Intangible cost
A cost associated with an information system, that cannot be easily measured in terms of dollars or with certainty.

Besides tangible and intangible costs, you can distinguish system-related development costs as either one-time or recurring. A **one-time cost** refers to a cost associated with project initiation and development and the start-up of the system. These costs typically encompass the following activities:

One-time cost
A cost associated with project initiation and development, or system start-up.

- System development
- New hardware and software purchases
- User training
- Site preparation
- Data or system conversion

When conducting an economic cost-benefit analysis, you should create a worksheet for capturing these expenses. This worksheet can be a two-column document or a multicolumn spreadsheet. For large projects, one-time costs may be staged over one or more years. In these cases, a separate one-time cost worksheet should be created for each year. This separation would make it easier to perform present-value calculations (see the following section "Time Value of

Recurring cost
A cost resulting from the ongoing evolution and use of the system.

Money"). A **recurring cost** refers to a cost resulting from the ongoing evolution and use of the system. Examples of these costs typically include:

- Application software maintenance
- Incremental data storage expense
- Incremental communications
- New software and hardware leases
- Consumable supplies and other expenses (e.g., paper, forms, data-center personnel)

Both one-time and recurring costs can consist of items that are fixed or variable in nature. Fixed costs refer to costs that are billed or incurred at a regular interval and usually at a fixed rate. A facility lease payment is an example of a fixed cost. Variable costs refer to items that vary in relation to usage. Long-distance phone charges are variable costs.

Jim and Jackie identified both one-time and recurring costs for the Customer Tracking System project. Figure 4-8 shows that this project will incur a one-time cost of $42,500. Figure 4-9 shows a recurring cost of $28,500 per year. One-time costs were established by discussing the system with Jim's boss, who felt that the system would require approximately four months to develop (at $5,000 per month). To run the new system effectively, the marketing department would need to upgrade at least five of its current workstations (at $3,000 each). Additionally, software licenses for each workstation (at $1,000 each) and modest user training fees (10 users at $250 each) would be necessary.

As you can see from Figure 4-9, Jim and Jackie estimate that the proposed system will require, on average, five months of annual maintenance, primarily for enhancements that users will request from the IS department. Other ongoing expenses such as increased data storage, communications equipment, and supplies should also be expected.

You should now have an understanding of the types of benefit and cost categories associated with an information systems project. In the next section, we address the relationship between time and money.

Time value of money (TVM)
The process of comparing present cash outlays to future expected returns.

The Time Value of Money Most techniques used to determine economic feasibility encompass the concept of the **time value of money (TVM).** TVM refers to comparing present cash outlays to future expected returns. As we've seen, the development of an information system has both one-time and recurring costs. Furthermore, benefits from systems development will likely occur sometime in the future. Because many projects may be competing for the

FIGURE 4-8
One-time costs worksheet for the Customer Tracking System at Pine Valley Furniture.

ONE-TIME COSTS WORKSHEET
Customer Tracking System Project

	Year 0
A. Development costs	$20,000
B. New hardware	15,000
C. New (purchased) software, if any	
1. Packaged applications software	5,000
2. Other _____	0
D. User training	2,500
E. Site preparation	0
F. Other _____	0
TOTAL One-Time Costs	**$42,500**

RECURRING COSTS WORKSHEET
Customer Tracking System Project

	Year 1 through 5
A. Application software maintenance	$25,000
B. Incremental data storage required: 20 GB × $50 (estimated cost/GB = $50)	1,000
C. Incremental communications (lines, messages, . . .)	2,000
D. New software or hardware leases	0
E. Supplies	500
F. Other_____	0
TOTAL Recurring Costs	**$28,500**

FIGURE 4-9
Recurring costs worksheet for the Customer Tracking System at Pine Valley Furniture.

same investment dollars and may have different useful life expectancies, all costs and benefits must be viewed in relation to their present, rather than future value when comparing investment options.

A simple example will help you understand the concept of TVM. Suppose you want to buy a used car from an acquaintance, and she asks that you make three payments of $1,500 for three years, beginning next year, for a total of $4,500. If she would agree to a single lump-sum payment at the time of sale (and if you had the money!), what amount do you think she would agree to? Should the single payment be $4,500? Should it be more or less? To answer this question, we must consider the time value of money. Most of us would gladly accept $4,500 today rather than three payments of $1,500, because a dollar today (or $4,500 for that matter) is worth more than a dollar tomorrow or next year, because money can be invested. The interest rate at which money can be borrowed or invested, the cost of capital, is called the **discount rate** for TVM calculations. Let's suppose that the seller could put the money received for the sale of the car in the bank and receive a 10 percent return on her investment. A simple formula can be used when figuring out the **present value** of the three $1,500 payments:

Discount rate
The interest rate used to compute the present value of future cash flows.

Present value
The current value of a future cash flow.

$$PV_n = Y \times \frac{1}{(1 + i)^n}$$

where PV_n is the present value of Y dollars n years from now, when i is the discount rate.

From our example, the present value of the three payments of $1,500 can be calculated as:

$$PV_1 = 1{,}500 \times \frac{1}{(1 + .10)^1} = 1{,}500 \times .9091 = 1{,}363.65$$

$$PV_2 = 1{,}500 \times \frac{1}{(1 + .10)^2} = 1{,}500 \times .8264 = 1{,}239.60$$

$$PV_3 = 1{,}500 \times \frac{1}{(1 + .10)^3} = 1{,}500 \times .7513 = 1{,}126.95$$

where PV_1, PV_2, and PV_3 reflect the present value of each $1,500 payment in year 1, 2, and 3, respectively.

To calculate the net present value (NPV) of the three $1,500 payments, simply add the present values calculated (NPV = $PV_1 + PV_2 + PV_3$ = 1,363.65 + 1,239.60 + 1,126.95 = $3,730.20). In other words, the seller could accept a lump sum payment of $3,730.20 as equivalent to the three payments of $1,500, given a discount rate of 10 percent.

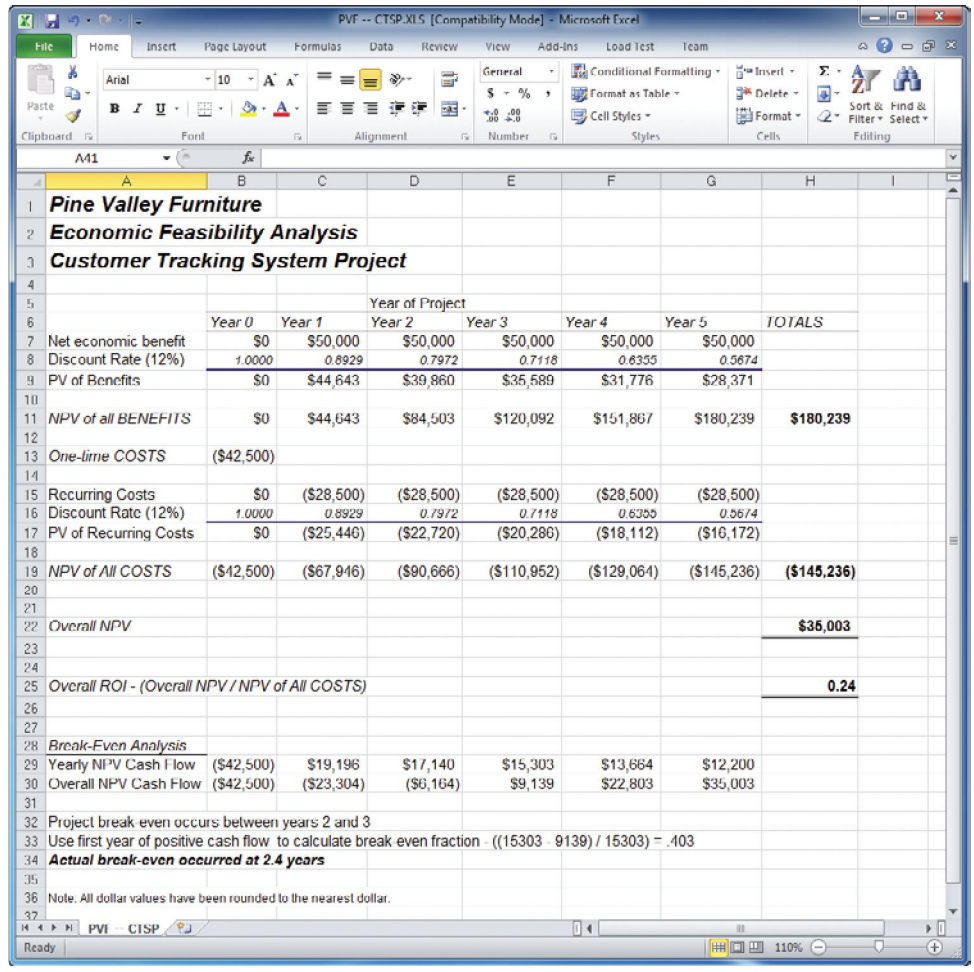
Now that we know the relationship between time and money, the next step in performing the economic analysis is to create a summary worksheet that reflects the present values of all benefits and costs. PVF's Systems Priority Board feels that the useful life of many information systems may not exceed five years. Therefore, all cost-benefit analysis calculations will be made using a five-year time horizon as the upper boundary on all time-related analyses. In addition, the management of PVF has set its cost of capital to be 12 percent (i.e., PVF's discount rate). The worksheet constructed by Jim is shown in Figure 4-10.

Cell H11 of the worksheet displayed in Figure 4-10 summarizes the NPV of the total tangible benefits from the project over five years ($180,239). Cell H19 summarizes the NPV of the total costs from the project. The NPV for the project, indicated in cell H22 ($35,003), shows that benefits from the project exceed costs.

The overall return on investment (ROI) for the project is also shown on the worksheet in cell H25 (0.24). Because alternative projects will likely have different benefit and cost values and, possibly, different life expectancies, the overall ROI value is useful for making project comparisons on an economic basis. Of course, this example shows ROI for the overall project over five years. An ROI analysis could be calculated for each year of the project.

Break-even analysis
A type of cost-benefit analysis to identify at what point (if ever) benefits equal costs.

The last analysis shown in Figure 4-10, on line 34, is a **break-even analysis.** The objective of the break-even analysis is to discover at what point (if ever) cumulative benefits equal costs (i.e., when break-even occurs). To conduct this analysis, the NPV of the yearly cash flows is determined. Here, the yearly cash flows are calculated by subtracting both the one-time cost and the present values of the recurring costs from the present value of the yearly benefits. The overall NPV of the cash flows reflect the total cash flows for all preceding


PVF -- CTSP.XLS [Compatibility Mode] - Microsoft Excel

	A	B	C	D	E	F	G	H
1	***Pine Valley Furniture***							
2	***Economic Feasibility Analysis***							
3	***Customer Tracking System Project***							
4								
5				Year of Project				
6		*Year 0*	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*TOTALS*
7	Net economic benefit	$0	$50,000	$50,000	$50,000	$50,000	$50,000	
8	Discount Rate (12%)	*1.0000*	*0.8929*	*0.7972*	*0.7118*	*0.6355*	*0.5674*	
9	PV of Benefits	$0	$44,643	$39,860	$35,589	$31,776	$28,371	
10								
11	*NPV of all BENEFITS*	$0	$44,643	$84,503	$120,092	$151,867	$180,239	**$180,239**
12								
13	*One-time COSTS*	($42,500)						
14								
15	Recurring Costs	$0	($28,500)	($28,500)	($28,500)	($28,500)	($28,500)	
16	Discount Rate (12%)	*1.0000*	*0.8929*	*0.7972*	*0.7118*	*0.6355*	*0.5674*	
17	PV of Recurring Costs	$0	($25,446)	($22,720)	($20,286)	($18,112)	($16,172)	
18								
19	*NPV of All COSTS*	($42,500)	($67,946)	($90,666)	($110,952)	($129,064)	($145,236)	**($145,236)**
20								
21								
22	*Overall NPV*							**$35,003**
23								
24								
25	*Overall ROI - (Overall NPV / NPV of All COSTS)*							**0.24**
26								
27								
28	*Break-Even Analysis*							
29	Yearly NPV Cash Flow	($42,500)	$19,196	$17,140	$15,303	$13,664	$12,200	
30	Overall NPV Cash Flow	($42,500)	($23,304)	($6,164)	$9,139	$22,803	$35,003	
31								
32	Project break even occurs between years 2 and 3							
33	Use first year of positive cash flow to calculate break even fraction ((15303 - 9139) / 15303) = .403							
34	***Actual break-even occurred at 2.4 years***							
35								
36	Note: All dollar values have been rounded to the nearest dollar.							
37								

FIGURE 4-10
Worksheet reflecting the present value calculations of all benefits and costs for the Customer Tracking System at Pine Valley Furniture. This worksheet indicates that benefits from the project over five years exceed its costs by $35,003.

years. If you examine line 30 of the worksheet, you'll see that break-even occurs between years two and three. Because year three is the first year in which the overall NPV cash flows figure is non-negative, identifying the point when break-even occurs can be derived as follows:

$$\text{Break-Even Ratio} = \frac{\text{Yearly NPV Cash Flow} - \text{Overall NPV Cash Flow}}{\text{Yearly NPV Cash Flow}}$$

Using data from Figure 4-10,

$$\text{Break-Even Ratio} = \frac{15{,}303 - 9{,}139}{15{,}303} = .403$$

Project break-even occurs at approximately 2.4 years. A graphical representation of this analysis is shown in Figure 4-11. Using the information from the economic analysis, PVF's Systems Priority Board will be in a much better position to understand the potential economic impact of the Customer Tracking System. Without this information, it would be virtually impossible to know the cost-benefits of a proposed system and would be impossible to make an informed decision on approving or rejecting the service request.

You can use many techniques to compute a project's economic feasibility. Because most information systems have a useful life of more than one year and will provide benefits and incur expenses for more than one year, most techniques for analyzing economic feasibility employ the concept of the time value of money, TVM. Table 4-5 describes three commonly used techniques for conducting economic feasibility analysis. (For a more detailed discussion of TVM or cost-benefit analysis techniques in general, the interested reader is encouraged to review an introductory finance or managerial accounting textbook.)

To be approved for continuation, a systems project may not have to achieve break-even or have an ROI greater than estimated during project initiation and planning. Because you may not be able to quantify many benefits or costs at this point in a project, such financial hurdles for a project may be unattainable. In this case, simply doing as thorough an economic analysis as possible, including producing a long list of intangibles, may be sufficient for the project to progress. One other option is to run the type of economic analysis shown in Figure 4-10 using pessimistic, optimistic, and expected benefit and cost estimates during project initiation and planning. This range of possible outcomes, along with the list of intangible benefits and the support of the requesting business unit, will often be enough to allow the project to continue to the analysis-phase. You must, however, be as precise as you can with the economic analysis, especially when investment capital is scarce. In this case, it may be necessary to conduct some typical analysis-phase activities during project initiation and planning in order to clearly identify inefficiencies and shortcomings with the existing system and to explain how a new system will overcome these problems.

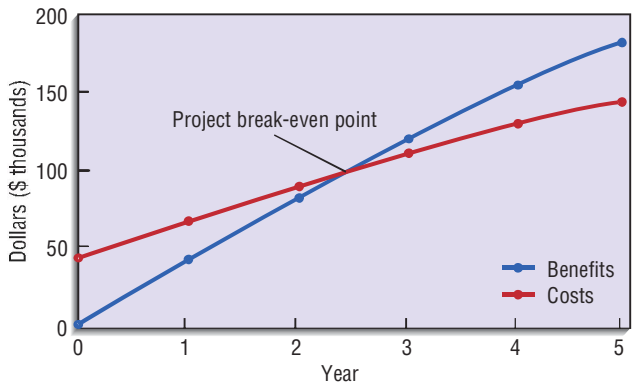


FIGURE 4-11
Break-even analysis for the Customer Tracking System at Pine Valley Furniture.

TABLE 4-5: Commonly Used Economic Cost-Benefit Analysis Techniques: Net Present Value, Return on Investment, and Break-Even Analysis

Analysis Technique	Description
Net present value (NPV)	NPV uses a discount rate determined from the company's cost of capital to establish the present value of a project. The discount rate is used to determine the present value of both cash receipts and outlays.
Return on investment (ROI)	ROI is the ratio of the net cash receipts of the project divided by the cash outlays of the project. Trade-off analysis can be made among projects competing for investment by comparing their representative ROI ratios.
Break-even analysis (BEA)	BEA finds the amount of time required for the cumulative cash flow from a project to equal its initial and ongoing investment.

Assessing Other Feasibility Concerns

Operational feasibility
The process of assessing the degree to which a proposed system solves business problems or takes advantage of business opportunities.

Technical feasibility
The process of assessing the development organization's ability to construct a proposed system.

Schedule feasibility
The process of assessing the degree to which the potential time frame and completion dates for all major activities within a project meet organizational deadlines and constraints for effecting change.

Legal and contractual feasibility
The process of assessing potential legal and contractual ramifications due to the construction of a system.

Political feasibility
The process of evaluating how key stakeholders within the organization view the proposed system.

You may need to consider other feasibility studies when formulating the business case for a system during project planning. **Operational feasibility** is the process of examining the likelihood that the project will attain its desired objectives. The goal of this study is to understand the degree to which the proposed system will likely solve the business problems or take advantage of the opportunities outlined in the system service request or project identification study. In other words, assessing operational feasibility requires that you gain a clear understanding of how an IS will fit into the current day-to-day operations of the organization.

The goal of **technical feasibility** is to understand the development organization's ability to construct the proposed system. This analysis should include an assessment of the development group's understanding of the possible target hardware, software, and operating environments to be used, as well as, system size, complexity, and the group's experience with similar systems. **Schedule feasibility** considers the likelihood that all potential time frames and completion-date schedules can be met and that meeting these dates will be sufficient for dealing with the needs of the organization. For example, a system may have to be operational by a government-imposed deadline by a particular point in the business cycle (such as the beginning of the season when new products are introduced), or at least by the time a competitor is expected to introduce a similar system.

Assessing **legal and contractual feasibility** requires that you gain an understanding of any potential legal and contractual ramifications due to the construction of the system. Considerations might include copyright or nondisclosure infringements, labor laws, antitrust legislation (which might limit the creation of systems to share data with other organizations), foreign trade regulations (e.g., some countries limit access to employee data by foreign corporations), and financial reporting standards as well as current or pending contractual obligations. Typically, legal and contractual feasibility is a greater consideration if your organization has historically used an outside organization for specific systems or services that you now are considering handling yourself. Assessing **political feasibility** involves understanding how key stakeholders within the organization view the proposed system. Because an information system may affect the distribution of information within the organization, and thus the distribution of power, the construction of an IS can have political ramifications. Those stakeholders not supporting the project may take steps to block, disrupt, or change the project's intended focus.

In summary, numerous feasibility issues must be considered when planning a project. This analysis should consider economic, operational, technical, schedule, legal, contractual, and political issues related to the project. In addition to these considerations, project selection by an organization may be influenced by issues beyond those discussed here. For example, projects may be selected for construction given high project costs and high technical risk if the system is viewed as a strategic necessity, that is, the project is viewed by the organization as being critical to its survival. Alternatively, projects may be selected because they are deemed to require few resources and have little risk. Projects may also be selected because of the power or persuasiveness of the manager proposing the system. This means that project selection may be influenced by factors beyond those discussed here and beyond items that can be analyzed. Your role as a systems analyst is to provide a thorough examination of the items that can be assessed so that a project review committee can make informed decisions. In the next section, we discuss how project plans are typically constructed.

Building the Baseline Project Plan

All the information collected during project initiation and planning is collected and organized into a document called the *baseline project plan*. Once the BPP is completed, a formal review of the project can be conducted with customers. This presentation, a walkthrough, is discussed later in the chapter. The focus of the walkthrough is to verify all information and assumptions in the baseline plan before moving ahead with the project. An outline of a baseline project plan, shown in Figure 4-12, contains four major sections:

1. Introduction
2. System description
3. Feasibility assessment
4. Management issues

The purpose of the *introduction* is to provide a brief overview of the entire document and outline a recommended course of action for the project. The introduction is often limited to only a few pages. Although it is sequenced as the first section of the BPP, it is often the final section to be written. It is only after performing most of the project planning activities that a clear overview and recommendation can be created. One initial activity that should be performed is the definition of the project scope, its range, which is an important part of the BPP's introduction section.

When defining the scope for the Customer Tracking System within PVF, Jim Woo first needed to gain a clear understanding of the project's objectives. Jim interviewed Jackie Judson and several of her colleagues to gain a good idea of their needs. He also reviewed the existing system's functionality, processes, and data-use requirements for performing customer tracking activities. These activities provided him with the information needed to define the project scope and to identify possible alternative solutions. Alternative system solutions can relate to different system scopes, platforms for deployment, or approaches to acquiring the system. We elaborate on the idea of alternative solutions, called *design strategies*, in Chapter 7. During project initiation and planning, the most crucial element of the design strategy is the system's scope. Scope depends on the answers to these questions:

- Which organizational units (business functions and divisions) might be affected by or use the proposed system or system change?
- With which current systems might the proposed system need to interact or be consistent, or which current systems might be changed because of a replacement system?

BASELINE PROJECT PLAN REPORT

1.0 Introduction

A. Project Overview—Provides an executive summary that specifies the project's scope, feasibility, justification, resource requirements, and schedules. Additionally, a brief statement of the problem, the environment in which the system is to be implemented, and constraints that affect the project are provided.

B. Recommendation—Provides a summary of important findings from the planning process and recommendations for subsequent activities.

2.0 System Description

A. Alternatives—Provides a brief presentation of alternative system configurations.

B. System Description—Provides a description of the selected configuration and a narrative of input information, tasks performed, and resultant information.

3.0 Feasibility Assessment

A. Economic Analysis—Provides an economic justification for the system using cost-benefit analysis.

B. Technical Analysis—Provides a discussion of relevant technical risk factors and an overall risk rating of the project.

C. Operational Analysis—Provides an analysis of how the proposed system solves business problems or takes advantage of business opportunities in addition to an assessment of how current day-to-day activities will be changed by the system.

D. Legal and Contractual Analysis—Provides a description of any legal or contractual risks related to the project (e.g., copyright or nondisclosure issues, data capture or transferring, and so on).

E. Political Analysis—Provides a description of how key stakeholders within the organization view the proposed system.

F. Schedules, Timeline, and Resource Analysis—Provides a description of potential time frame and completion-date scenarios using various resource allocation schemes.

4.0 Management Issues

A. Team Configuration and Management—Provides a description of the team member roles and reporting relationships.

B. Communication Plan—Provides a description of the communication procedures to be followed by management, team members, and the customer.

C. Project Standards and Procedures—Provides a description of how deliverables will be evaluated and accepted by the customer.

D. Other Project-Specific Topics—Provides a description of any other relevant issues related to the project uncovered during planning.

FIGURE 4-12
An outline of a baseline project plan contains four major sections: introduction, system description, feasibility assessment, and management issues.

- Who inside and outside the requesting organization (or the organization as a whole) might care about the proposed system?
- What range of potential system capabilities is to be considered?

Project scope statement
A document prepared for the customer that describes what the project will deliver and outlines generally at a high level all work required to complete the project.

The statement of project scope for the Customer Tracking System project at PVF is shown in Figure 4-13. A **project scope statement** is a short document prepared primarily for the customer to clearly describe what the project will deliver and outline generally at a high level all the work required for completing the project. It is therefore a useful communication tool. The project scope statement ensures that both you and your customer gain a common understanding of the project size, duration, and outcomes. The project scope statement is an

Pine Valley Furniture
Project Scope Statement

Prepared by: Jim Woo
Date: September 20, 2012

General Project Information

Project Name: Customer Tracking System
Sponsor: Jackie Judson, VP Marketing
Project Manager: Jim Woo

Problem/Opportunity Statement:

Sales growth has outpaced the marketing department's ability to track and forecast customer buying trends accurately. An improved method for performing this process must be found in order to reach company objectives.

Project Objectives:

To enable the marketing department to track and forecast customer buying patterns accurately in order to better serve customers with the best mix of products. This will also enable PVF to identify the proper application of production and material resources.

Project Description:

A new information system will be constructed that will collect all customer purchasing activity, support display and reporting of sales information, aggregate data, and show trends in order to assist marketing personnel in understanding dynamic market conditions. The project will follow PVF's systems development life cycle.

Business Benefits:

Improved understanding of customer buying patterns
Improved utilization of marketing and sales personnel
Improved utilization of production and materials

Project Deliverables:

Customer tracking system analysis and design
Customer tracking system programs
Customer tracking documentation
Training procedures

Estimated Project Duration:

5 months

FIGURE 4-13
Project scope statement for the Customer Tracking System at Pine Valley Furniture.

easy document to create because it typically consists of a high-level summary of the baseline project plan (BPP) information (described next).

Depending upon your relationship with your customer, the role of the project scope statement may vary. At one extreme, the project scope statement can be used as the basis of a formal contractual agreement outlining firm deadlines, costs, and specifications. At the other extreme, the project scope statement can simply be used as a communication vehicle to outline the current best estimates of what the project will deliver, when it will be completed, and the resources it may consume. A contract programming or consulting firm, for example, may establish a formal relationship with a customer and use a project charter that is more extensive and formal. Alternatively, an internal development group may develop a project scope statement that is shorter and less formal, as it will be intended to inform customers rather than to set contractual obligations and deadlines.

For the Customer Tracking System (CTS), project scope was defined using only textual information. It is not uncommon, however, to define project scope using tools such as data-flow diagrams and entity-relationship models. For example, Figure 4-14 shows a context-level data-flow diagram used to define system scope for PVF's Purchasing Fulfillment System. As shown in Figure 4-14, the Purchasing Fulfillment System interacts with the production schedulers, suppliers, and engineering. You will learn much more about data-flow diagrams in Chapter 6. The other items in the introduction section of the BPP are simply executive summaries of the other sections of the document.

The second section of the BPP is the *system description*, in which you outline possible alternative solutions to the one deemed most appropriate for the given situation. Note that this description is at a high level, mostly narrative in form. Alternatives may be stated as simply as this:

1. Web-based online system
2. Mainframe with central database
3. Local area network with decentralized databases
4. Batch data input with online retrieval
5. Purchasing of a prewritten package

If the project is approved for construction or purchase, you will need to collect and structure information in a more detailed and rigorous manner during the systems analysis phase and evaluate in greater depth these and other alternatives for the system.

When Jim and Jackie were considering system alternatives for the CTS, they focused on two primary issues. First, they discussed how the system would be acquired and considered three options: (1) purchase the system if one could be found that met PVF's needs, (2) outsource the development of the system to an outside organization, or (3) build the system within PVF. Next, Jim and Jackie defined the comprehensiveness of the system's functionality. To complete this task, Jackie wrote a series of statements listing the types of tasks that she thought marketing personnel would be able to accomplish when using the CTS. This list became the basis of the system description and was instrumental in helping them make the acquisition decision. After considering the unique needs of the marketing group, they decided that the best decision was to build the system within PVF.

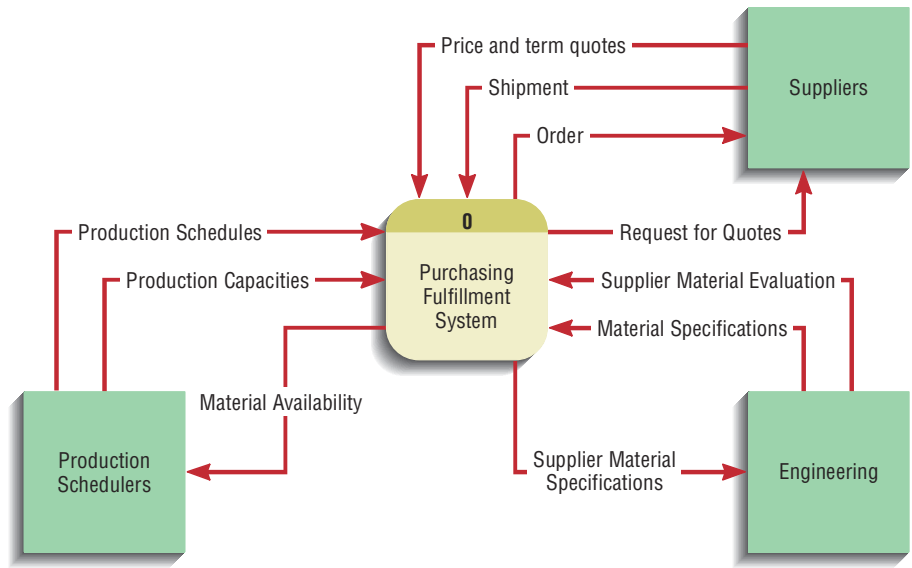


FIGURE 4-14
Context-level data-flow diagram showing project scope for the purchasing fulfillment system at Pine Valley Furniture.

In the third section of the BPP, *feasibility assessment*, the systems analyst outlines project costs and benefits and technical difficulties. This section is where high-level project schedules are specified using Network diagrams and Gantt charts. Recall from Chapter 3 that this process is referred to as a *work breakdown structure.* During project initiation and planning, task and activity estimates are generally not detailed. An accurate work breakdown can be done only for the next one or two life-cycle activities—systems analysis and systems design. After defining the primary tasks for the project, an estimate of the resource requirements can be made. As with defining tasks and activities, this activity involves obtaining estimates of the human resource requirements, because people are typically the most expensive resource element of a project. Once you define the major tasks and resource requirements, a preliminary schedule can be developed. Defining an acceptable schedule may require that you find additional or different resources or that the scope of the project be changed. The greatest amount of project planning effort is typically expended on feasibility assessment activities.

The final section of the BPP, *management issues*, outlines the concerns that management has about the project. It will be a short section if the proposed project is going to be conducted exactly as prescribed by the organization's standard systems development methodology. Most projects, however, have some unique characteristics that require minor to major deviation from the standard methodology. In the team configuration and management portion, you identify the types of people to work on the project, who will be responsible for which tasks, and how work will be supervised and reviewed (see Figure 4-15). In the communication

Project: WebStore		**Prepared by:** Juan Gonzales				**Legend:** P = Primary S = Support	
Manager: Juan Gonzales		**Page: 1 of 1**					
		Responsibility Matrix					
Task ID	**Task**	**Jordan**	**James**	**Jackie**	**Jeremy**	**Kim**	**Juan**
A	Collect requirements	P	S				S
B	Develop data model			P		S	S
C	Program interface		P		S		S
D	Build database			S		P	S
F	Design test scenarios	S	S	S	P	S	S
G	Run test scenarios	S	S	S	S	S	P
H	User documentation	P	S				S
I	Install system	S	P			S	S
J	Customer support	S	P			S	S

FIGURE 4-15
Task-responsibility matrix.

Stakeholder	Document	Format	Team Contact	Date Due
Team Members	Project Status Report	Project Intranet	Juan Kim	First Monday of Month
Management Supervisor	Project Status Report	Hard Copy	Juan Kim	First Monday of Month
User	Project Status Report	Hard Copy	James Kim	First Monday of Month
Internal IT Staff	Project Status Report	E-mail	Jackie James	First Monday of Month
IT Manager	Project Status Report	Hard Copy	Juan Jeremy	First Monday of Month
Contract Programmers	Software Specifications	E-mail/Project Intranet	Jordan Kim	October 4, 2012
Training Subcontractor	Implementation and Training Plan	Hard Copy	Jordan James	January 10, 2012

FIGURE 4-16
The Project Communication Matrix provides a high-level summary of the communication plan.

plan portion, you explain how the user will be kept informed about project progress, such as periodic review meetings or even a newsletter, and which mechanisms will be used to foster sharing of ideas among team members, such as a computer-based conference facility (see Figure 4-16). An example of the type of information contained in the project standards and procedures portion would be procedures for submitting and approving project change requests and any other issues deemed important for the project's success.

You should now have a feel for how a BPP is constructed and the types of information it contains. Its creation is not meant to be a project in and of itself but rather a step in the overall systems development process. Developing the BPP has two primary objectives. First, it helps to assure that the customer and development group share a common understanding of the project. Second, it helps to provide the sponsoring organization with a clear idea of the scope, benefits, and duration of the project. Meeting these objectives creates the foundation for a successful project.

Reviewing the Baseline Project Plan

Before phase 2 of the SDLC analysis can begin, the users, management, and development group must review and approve the baseline project plan. This review takes place before the BPP is submitted or presented to some project approval body, such as an IS steering committee or the person who must fund the project. The objective of this review is to ensure that the proposed system conforms to organizational standards and to make sure that all relevant parties understand and agree with the information contained in the baseline project plan. A common method for performing this review (as well as reviews during subsequent life-cycle phases) is called a **walkthrough.** Walkthroughs, also called *structured walkthroughs*, are peer group reviews of any product created during the systems development process. They are widely used by professional development organizations, such as IBM, Xerox, and the U.S. government, and have proven effective in ensuring the quality of an information system. As a systems analyst, you will frequently be involved in walkthroughs.

Walkthrough
A peer group review of any product created during the systems development process; also called a *structured walkthrough.*

Although walkthroughs are not rigidly formal or exceedingly long in duration, they have a specific agenda that highlights what is to be covered and the expected completion time. Individuals attending the meeting have specific roles. These roles can include the following:

- *Coordinator:* This person plans the meeting and facilitates discussions. This person may be the project leader or a lead analyst responsible for the current life-cycle step.
- *Presenter:* This person describes the work product to the group. The presenter is usually an analyst who has done all or some of the work being presented.
- *User:* This person (or group) makes sure that the work product meets the needs of the project's customers. This user would usually be someone not on the project team.
- *Secretary:* This person takes notes and records decisions or recommendations made by the group. This may be a clerk assigned to the project team or one of the analysts on the team.
- *Standards bearer:* This person ensures that the work product adheres to organizational technical standards. Many larger organizations have staff groups within the unit responsible for establishing standard procedures, methods, and documentation formats. For example, within Microsoft, user interface standards are developed and rigorously enforced on all development projects. As a result, all systems have the same look and feel to users. These standards bearer validate the work so that it can be used by others in the development organization.
- *Maintenance oracle:* This person reviews the work product in terms of future maintenance activities. The goal is to make the system and its documentation easy to maintain.

After Jim and Jackie completed their BPP for the Customer Tracking System, Jim approached his boss and requested that a walkthrough meeting be scheduled and a walkthrough coordinator be assigned to the project. PVF provides the coordinator with a Walkthrough Review Form, shown in Figure 4-17. Using this form, the coordinator can easily make sure that a qualified individual is assigned to each walkthrough role; that each member has been given a copy of the review materials; and that each member knows the agenda, date, time, and location of the meeting. At the meeting, Jim presented the BPP, and Jackie

Pine Valley Furniture
Walkthrough Review Form

Session Coordinator:

Project/Segment:

Coordinator's Checklist:

1. Confirmation with producer(s) that material is ready and stable:_____
2. Issue invitations, assign responsibilities, distribute materials: [ ] Y [ ] N
3. Set date, time, and location for meeting:

   Date: ___ /___ /___ Time: _____ A.M. / P.M. (circle one)

   Location: _____

Responsibilities	*Participants*	*Can Attend*	*Received Materials*
Coordinator	_____	[ ] Y [ ] N	[ ] Y [ ] N
Presenter	_____	[ ] Y [ ] N	[ ] Y [ ] N
User	_____	[ ] Y [ ] N	[ ] Y [ ] N
Secretary	_____	[ ] Y [ ] N	[ ] Y [ ] N
Standards	_____	[ ] Y [ ] N	[ ] Y [ ] N
Maintenance	_____	[ ] Y [ ] N	[ ] Y [ ] N

Agenda:

___ 1. All participants agree to follow PVF's Rules of a Walkthrough
___ 2. New material: Walkthrough of all material
___ 3. Old material: Item-by-item checkoff of previous action list
___ 4. Creation of new action list (contribution by each participant)
___ 5. Group decision (see below)
___ 6. Deliver copy of this form to the project control manager

Group Decision:

_____ Accept product as-is
_____ Revise (no further walkthrough)
_____ Review and schedule another walkthrough

Signatures		

FIGURE 4-17
Walkthrough Review Form for the Customer Tracking System at Pine Valley Furniture.

added comments from a user perspective. Once the walkthrough presentation was completed, the coordinator polled each representative for his or her recommendation concerning the work product. The results of this voting may result in validation of the work product, validation pending changes suggested during the meeting, or a suggestion that the work product requires major revision before being presented for approval. In the last case, substantial changes

to the work product are usually requested, after which another walkthrough must be scheduled before the project can be proposed to the Systems Priority Board (steering committee). In the case of the Customer Tracking System, the BPP was supported by the walkthrough panel pending some minor changes to the duration estimates of the schedule. These suggested changes were recorded by the secretary on a Walkthrough Action List, shown in Figure 4-18, and given

Pine Valley Furniture
Walkthrough Action List

Session Coordinator:

Project/Segment:

Date and Time of Walkthrough:

Date: ___ /___ /___ Time: _____ A.M. / P.M. (circle one)

Fixed (✓)	*Issues raised in review:*

FIGURE 4-18
Walkthrough Action List for Pine Valley Furniture.

to Jim to incorporate into the next version of the baseline plan presented to the steering committee.

Walkthrough meetings are a common occurrence in most systems development groups. In addition to reviewing the BPP, these meetings can be used for the following activities:

- System specifications
- Logical and physical designs
- Code or program segments
- Test procedures and results
- Manuals and documentation

One of the key advantages to using a structured review process is to ensure that formal review points occur during the project. At each subsequent phase of the project, a formal review should be conducted (and shown on the project schedule) to make sure that all aspects of the project are satisfactorily accomplished before assigning additional resources to the project. This conservative approach of reviewing each major project activity with continuation contingent on successful completion of the prior phase is called *incremental commitment*. It is much easier to stop or redirect a project at any point when using this approach.

Walkthroughs are used throughout the duration of the project for briefing team members and external stakeholders. These presentations can provide many benefits to the team but, unfortunately, are often not well done. With the proliferation of computer technology and the availability of powerful software to assist in designing and delivering presentations, making an effective presentation has never been easier. Microsoft's PowerPoint has emerged as the de facto standard for creating computer-based presentations. Although this program is relatively easy to use, it can also be misused such that the "bells and whistles" added to a computer-based presentation actually detract from the presentation. Like any project, to make an effective presentation it must be planned, designed, and delivered. Planning and designing your presentation is equally important as delivering it. If your slides are poorly laid out, hard to read, or inconsistent, it won't matter how good your delivery is; your audience will think more about the poor quality of the slides, than about what you are saying. Fortunately, with a little work it is easy to design a high-quality presentation if you follow a few simple steps that are outlined in Table 4-6.

Pine Valley Furniture WebStore: Systems Planning and Selection

Most businesses have discovered the power of Internet-based electronic commerce as a means to communicate efficiently with customers and to extend their marketing reach. As a systems analyst, you and a project team may be asked by your employer to help determine whether an Internet-based electronic commerce application fits the goals of the company and, if so, how that application should be implemented.

The systems planning and selection process for an Internet-based electronic commerce application is no different than the process followed for other applications. Nonetheless, you should take into account special issues when developing an Internet-based application. In this section, we highlight those issues.

Internet
A network of interconnected individual networks that use a common protocol to communicate with each other; a global computing network to support business-to-consumer electronic commerce.

Internet Basics

The term *Internet* is derived from the term *internetworking*. The **Internet** is a global network comprised of thousands of interconnected individual

TABLE 4-6: Guidelines for Making an Effective Presentation

Presentation Planning	
Who is the audience?	To design the most effective presentation, you need to consider the audience (e.g., What do they know about your topic? What is their education level?).
What is the message?	Your presentation should be designed with a particular objective in mind.
What is the presentation environment?	Knowledge of the room size, shape, and lighting is valuable information for designing an optimal presentation.
Presentation Design	
Organize the sequence	Organize your presentation so that related elements or topics are found in one place instead of scattered throughout the material in random fashion.
Keep it simple	Make sure that you don't pack too much information onto a slide so that it is difficult to read. Also, work to have as few slides as possible; in other words, only include information that you absolutely need.
Be consistent	Make sure that you are consistent in the types of fonts, font sizes, colors, design approach, and backgrounds.
Use variety	Use both textual and graphical slides to convey information in the most meaningful format.
Don't rely on the spell checker alone	Make sure you carefully review your presentation for typographical and grammatical errors.
Use bells and whistles sparingly	Make sure that you use familiar graphical icons to guide and enhance slides; don't lose sight of your message as you add bells and whistles. Also, take great care when making transitions between slides and elements so that "special effects" don't take away from your message.
Supplemental materials	Take care when using supplemental materials so that they don't distract the audience. For example, don't provide handouts until you want the audience to actually read this material.
Have a clear beginning and end	At the beginning, introduce yourself and your teammates (if any), thank your audience for being there, and provide a clear outline of what will be covered during the presentation. At the conclusion, have a concluding slide so that the audience clearly sees that the presentation is over.
Presentation Delivery	
Practice	Make sure that you thoroughly test your completed work on yourself and others to be sure it covers your points and presents them in an effective manner within the time frame required.
Arrive early and cue up your presentation	It is good practice when feasible to have your presentation ready to go prior to the arrival of the audience.
Learn to use the special software keys	Using special keys to navigate the presentation will allow you to focus on your message and not on the software.
Have a backup plan	Have a backup plan in case technology fails or your presentation is lost when traveling.
Delivery	To make an effective presentation, you must become an effective public speaker through practice.
Personal appearance	Your appearance and demeanor can go a long way toward enhancing how the audience receives your presentation.

networks that communicate with each other through *TCP/IP* (transmission control protocol/Internet protocol). Using the Internet and other technologies to support day-to-day business activities, such as communicating with customers and selling goods and services online, is referred to as **electronic commerce (EC),** also called e-commerce. Note that EC can also refer to the use of non-Internet technologies such as telephone voice-messaging systems

Electronic commerce (EC) Internet-based communication and other technologies that support day-to-day business activities.

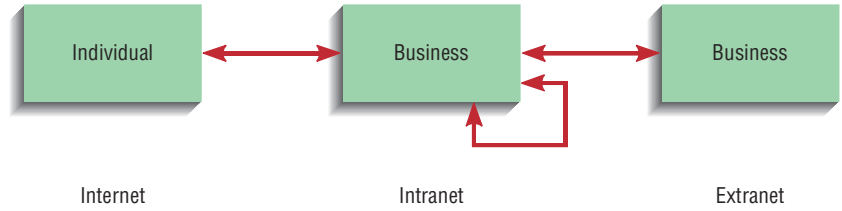


FIGURE 4-19
Three possible modes of electronic commerce.

that route and process customer requests and inquiries. Nonetheless, for our purposes, we will use *EC* to mean Internet-enabled business. The three classes of Internet EC applications are Internet, intranet, and extranet, as illustrated in Figure 4-19. Internet-based EC is transactions between individuals and businesses. **Intranet** refers to the use of the Internet within the same business. **Extranet** refers to Internet-based communication to support business-to-business activities.

Intranet
Internet-based communication to support business activities within a single organization.

Extranet
Internet-based communication to support business-to-business activities.

Intranets and extranets are examples of two ways organizations communicate via technology. Having an intranet is a lot like having a "global" local area network. A company may create an intranet to house commonly used forms, up-to-date information on sales, and human resource information so that employees can access them easily and at any time. Organizations that have intranets dictate: (1) what applications will run over the intranet—such as electronic mail or an inventory control system, and (2) the speed and quality of the hardware connected to the intranet. Intranets are a new way of using information systems to support business activities within a single organization. Extranets are another new way of using an established computing model, **electronic data interchange (EDI).** EDI refers to the use of telecommunication technologies to transfer business documents directly between organizations. Using EDI, trading partners—suppliers, manufacturers, and customers—establish computer-to-computer links that allow them to exchange data electronically. For example, a car manufacturer using EDI may send an electronic purchase order to a steel or tire supplier instead of a paper request. The paper order may take several days to arrive at the supplier, whereas an EDI purchase order will take only a few seconds. EDI is fast becoming the standard by which organizations will communicate with each other in the world of electronic commerce.

Electronic data interchange (EDI)
The use of telecommunication technologies to transfer business documents directly between organizations.

When developing either an intranet or an extranet, developers know who the users are, what applications will be used, the speed of the network connection, and the type of communication devices (e.g., Web browsers such as Firefox, Chrome, or Internet Explorer, smart phones such as an iPhone). On the other hand, when developing an Internet EC application, developers have to discern countless unknowns in order to build a useful system. Table 4-7 lists several unknowns you and your project team may deal with when designing and building an EC. These unknowns may result in making trade-offs based on a careful analysis of who the users are likely to be, where they are likely to be located, and how they are likely to be connected to the Internet. Even with all these difficulties to contend with, you will find no shortage of Internet ECs springing up all across the world. One company that has decided to get onto the Web with its own EC site is Pine Valley Furniture.

Pine Valley Furniture WebStore

The PVF board of directors has requested that a project team be created to explore the opportunity to develop an EC system. Specifically, market research

TABLE 4-7: Unknowns That Must Be Dealt with When Designing and Building Internet Applications

User	Concern: Who is the user? Examples: Where is the user located? What is their expertise, education, or expectations?
Connection Speed	Concern: What is the speed of the connection and what information can be effectively displayed? Examples: modem, cable modem, satellite, broadband, cellular
Access Method	Concern: What is the method of accessing the Internet? Examples: Web browser, personal digital assistant (PDA), Web-enabled cellular phone, Web-enabled television

has found a good opportunity for online furniture purchases, especially in the areas of:

- Corporate furniture buying
- Home-office furniture purchasing
- Student furniture purchasing

The board wants to incorporate all three target markets into its long-term EC plan but wants to focus initially on the corporate furniture buying system. The board feels that this segment has the greatest potential to provide an adequate return on investment and would be a good building block for moving into the customer-based markets. Because the corporate furniture buying system will be specifically targeted to the business furniture market, it will be easier to define the system's operational requirements. Additionally, this EC system should integrate nicely with two currently existing systems, Purchasing Fulfillment and Customer Tracking. Together, these attributes make it an ideal candidate for initiating PVF's Web strategy.

Initiating and Planning PVF's E-Commerce System Given the high priority of this project, Jackie Judson, vice president of marketing, and senior systems analyst Jim Woo were assigned to work on this project. As for the Customer Tracking System described earlier in the chapter, their first activity was to begin the project's initiation and planning activity. Over the next few days, Jim and Jackie met several times to initiate and plan the proposed system. At the first meeting, they agreed that "WebStore" would be the proposed system project name. Next, they worked on identifying potential benefits, costs, and feasibility concerns. Jim developed a list of potential costs the company would incur to develop Web-based systems that he shared with Jackie and the other project team members (see Table 4-8).

WebStore Project Walkthrough After meeting with the project team, Jim and Jackie established an initial list of benefits and costs (see Table 4-9) as well as several feasibility concerns (see Table 4-10). Next, Jim worked with several of PVF's technical specialists to develop an initial project schedule. Figure 4-20 shows the Gantt chart for this 84-day schedule. Finally, Jim and Jackie presented their initial project plans in a walkthrough to PVF's board of directors and senior management. All were excited about the project plan and approval was given to move the WebStore project on to the analysis phase.

TABLE 4-8: Web-Based System Costs

Cost Category	Examples
Platform costs	Web-hosting service Web server Server software Software plug-ins Firewall server Router Internet connection
Content and service	Creative design and development Ongoing design fees Web project manager Technical site manager Content staff Graphics staff Support staff Site enhancement funds Fees to license outside content Programming, consulting, and research Training and travel
Marketing	Direct mail Launch and ongoing public relations Print advertisement Paid links to other Web sites Promotions Marketing staff Advertising sales staff

TABLE 4-9: PVF WebStore Project Benefits and Costs

Tangible Benefits	**Intangible Benefits**
Lower per-transaction overhead cost	First to market
Repeat business	Foundation for complete Web-based IS
Tangible Costs (one-time)	Simplicity for customers
Internet service setup fee	**Intangible Costs**
Hardware	No face-to-face interaction
Development cost	Not all customers use Internet
Data entry	
Tangible Costs (recurring)	
Internet service hosting fee	
Software	
Support	
Maintenance	
Decreased sales via traditional channels	

TABLE 4-10: PVF WebStore Feasibility Concerns

Feasibility Concern	Description
Operational	Online store open 24/7/365; returns/customer support
Technical	New skill set for development, maintenance, and operation
Schedule	Must be open for business by Q3
Legal	Credit card fraud
Political	Traditional distribution channel loses business

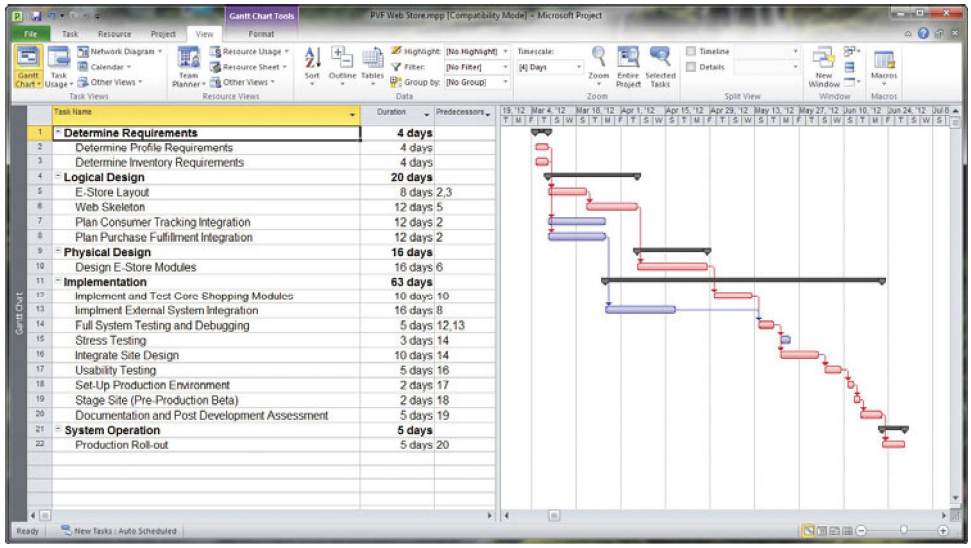


FIGURE 4-20
Gantt chart showing the schedule for the WebStore project.

Key Points Review

1. **Describe the steps involved when identifying and selecting projects and initiating and planning projects.**

   Project identification and selection consists of three primary activities: identifying potential development projects, classifying and ranking projects, and selecting projects for development. A variety of organizational members or units can be assigned to perform this process, including top management, a diverse steering committee, business units and functional managers, the development group, or the most senior IS executive. Potential projects can be evaluated and selected using a broad range of criteria such as value chain analysis, alignment with business strategy, potential benefits, resource availability and requirements, and risks. Project initiation and planning is a critical activity in the life of a project. At this point, projects are accepted for development, rejected as infeasible, or redirected. The objective of this process is to transform a vague system request into a tangible system description, clearly outlining the objectives, feasibility issues, benefits, costs, and time schedules for the project. Project initiation includes forming the project initiation team, establishing customer relationships, developing a plan to get the project started, setting project management procedures, and creating an overall project management environment. After project initiation, project planning focuses on assessing numerous feasibility issues associated with the project in order to create a clear baseline project plan.

2. **Explain the need for and the contents of a project scope statement and a baseline project plan.**

   A project scope statement and a baseline project plan are created during project initiation and planning. The project scope statement is a short document prepared for the customer that describes

what the project will deliver and outlines all work required to complete the project; it ensures that both you and your customer gain a common understanding of the project. The baseline project plan contains an introduction, a high-level description of the proposed system or system change, an outline of the various feasibilities, and an overview of management issues specific to the project. Before the development of an information system can begin, the users, management, and development group must review and agree on this specification.

3. **List and describe various methods for assessing project feasibility.**

   Assessing project feasibility can include an examination of economic, operational, technical, schedule, legal and contractual, and political aspects of the project. This assessment is influenced by the project size, the type of system proposed, and the collective experience of the development group and potential customers of the system. High project costs and risks are not necessarily bad; rather it is more important that the organization understands the costs and risks associated with a project and with the portfolio of active projects before proceeding.

4. **Describe the differences between tangible and intangible benefits and costs, and the differences between one-time and recurring costs.**

   Tangible benefits can be easily measured in dollars and with certainty. Intangible benefits cannot be easily measured in dollars or with certainty. Tangible costs can be easily measured in dollars and with certainty. Intangible costs cannot be easily measured in terms of dollars or with certainty. One-time costs are associated with project start-up and development. Recurring costs result from the ongoing evolution and use of a system.

5. **Perform cost-benefit analysis and describe what is meant by the time value of money, present value, discount rate, net present value, return on investment, and break-even analysis.**

   The time value of money refers to comparing present cash outlays to future expected returns. Thus, the present value represents the current value of a future cash flow. The discount rate refers to the rate of return used to compute the present value of future cash flows. The net present value uses a discount rate to gain the present value of a project's overall benefits and costs. The return on investment is the ratio of the cash benefits of a project divided by the cash costs; trade-off analysis can be made among projects by comparing their representative ROI ratios. Break-even analysis finds the amount of time required for the cumulative incoming cash flow (the benefits) from a project to equal its initial and ongoing investment (the costs).

6. **Describe the activities and participant roles within a structured walkthrough.**

   A walkthrough assesses the merits of the project and ensures that the project, if accepted for development, conforms to organizational standards and goals. An objective of this process is also to make sure that all relevant parties understand and agree with the information contained in the baseline project plan before subsequent development activities begin. Several individuals participate in a walkthrough, including the coordinator, presenter, user, secretary, standards bearer, and maintenance oracle. Each plays a specific role to make sure that the walkthrough is a success. Walkthroughs are used to assess all types of project deliverables, including system specifications, logical and physical designs, code and program segments, test procedures and results, and manuals and documentation.

Key Terms Checkpoint

Here are the key terms from the chapter. The page where each term is first explained is in parentheses after the term.

1. Baseline project plan (BPP) (p. 89)
2. Break-even analysis (p. 96)
3. Business case (p. 89)
4. Discount rate (p. 95)
5. Economic feasibility (p. 92)
6. Electronic commerce (EC) (p. 109)
7. Electronic data interchange (EDI) (p. 110)
8. Extranet (p. 110)
9. Incremental commitment (p. 88)
10. Intangible benefit (p. 93)
11. Intangible cost (p. 93)
12. Internet (p. 108)

13. Intranet (p. 110)
14. Legal and contractual feasibility (p. 98)
15. One-time cost (p. 93)
16. Operational feasibility (p. 98)
17. Political feasibility (p. 98)
18. Present value (p. 95)
19. Project scope statement (p. 100)
20. Recurring cost (p. 94)
21. Schedule feasibility (p. 98)
22. Tangible benefit (p. 92)
23. Tangible cost (p. 93)
24. Technical feasibility (p. 98)
25. Time value of money (TVM) (p. 94)
26. Walkthrough (p. 105)

Match each of the key terms above with the definition that best fits it.

____ 1. The process of evaluating how key stakeholders within the organization view the proposed system.
____ 2. A document prepared for the customer that describes what the project will deliver and outlines generally at a high level all work required to complete the project.
____ 3. A written report that outlines the justification for an information system. This report highlights economic benefits and costs and the technical and organizational feasibility of the proposed system.
____ 4. A process of identifying the financial benefits and costs associated with a development project.
____ 5. A strategy in systems analysis and design in which the project is reviewed after each phase, and continuation of the project is rejustified in each of these reviews.
____ 6. A cost resulting from the ongoing evolution and use of the system.
____ 7. The interest rate used to compute the present value of future cash flows.
____ 8. A benefit derived from the creation of an information system, that cannot be easily measured in dollars or with certainty.
____ 9. A network of interconnected individual networks that use a common protocol to communicate with each other; a global computing network to support business-to-consumer electronic commerce.
____ 10. The process of assessing the degree to which the potential time frame and completion dates for all major activities within a project meet organizational deadlines and constraints for affecting change.
____ 11. A cost associated with an information system, that can be easily measured in dollars and with certainty.
____ 12. Internet-based communication and other technologies that support day-to-day business activities.
____ 13. A peer group review of any product created during the systems development process.
____ 14. A process of assessing the development organization's ability to construct a proposed system.
____ 15. A cost associated with project initiation and development, or system start-up.
____ 16. The current value of a future cash flow.
____ 17. Internet-based communication to support business activities within a single organization.
____ 18. A benefit derived from the creation of an information system, that can be measured in dollars and with certainty.
____ 19. The process of assessing potential legal and contractual ramifications due to the construction of a system.
____ 20. A cost associated with an information system, that cannot be easily measured in terms of dollars or with certainty.
____ 21. One of the major outcomes and deliverables from the project initiation and planning phase. It contains the best estimate of the project's scope, benefits, costs, risks, and resource requirements.
____ 22. The process of assessing the degree to which a proposed system solves business problems or takes advantage of business opportunities.
____ 23. The process of comparing present cash outlays to future expected returns.
____ 24. A type of cost-benefit analysis to identify at what point (if ever) benefits equal costs.
____ 25. Internet-based communication to support business-to-business activities.
____ 26. The use of telecommunications technologies to transfer business documents directly between organizations.

Review Questions

1. Describe the project identification and selection process.
2. Describe several project evaluation criteria.
3. List and describe the steps in the project initiation and planning process.
4. What is contained in a baseline project plan? Are the content and format of all baseline plans the same? Why or why not?
5. Describe three commonly used methods for performing economic cost-benefit analysis.
6. List and discuss the different types of project feasibility factors. Is any factor most important? Why or why not?
7. What are the potential consequences of not assessing the technical risks associated with an information systems development project?
8. What are the types or categories of benefits from an IS project?
9. What intangible benefits might an organization obtain from the development of an IS?
10. Describe the concept of the time value of money. How does the discount rate affect the value of $1 today versus one year from today?
11. Describe the structured walkthrough process. What roles need to be performed during a walkthrough?

Problems and Exercises

1. The economic analysis carried out during project identification and selection is rather superficial. Why is this? Consequently, what factors do you think tend to be most important for a potential project to survive this first phase of the life cycle?
2. Consider your use of a PC at either home or work and list tangible benefits from an information system. Based on this list, does your use of a PC seem to be beneficial? Why or why not?
3. Assume you are put in charge of launching a new Web site for a local nonprofit organization. What costs would you need to account for? Make a list of expected costs and benefits for the project. You don't need to list values, just sources of expense. Consider both one-time and recurring costs.
4. Consider the situation you addressed in Problem and Exercise 3. Create numeric cost estimates for each of the costs you listed. Calculate the net present value and return on investment. Include a break-even analysis. Assume a 10 percent discount rate and a five-year time horizon.
5. Consider the situation you addressed in Problem and Exercise 3. Create a sample project scope statement, following the structure shown in Figure 4-13.
6. Assuming monetary benefits of an information system at $85,000 per year, one-time costs of $75,000, recurring costs of $35,000 per year, a discount rate of 12 percent, and a five-year time horizon, calculate the net present value of these costs and benefits of an information system. Also calculate the overall return on investment of the project and then present a break-even analysis. At what point does break-even occur?
7. Use the outline for the baseline project plan provided in Figure 4-12 to present the system specifications for the information system you chose for Problem and Exercise 3.
8. Change the discount rate for Problem and Exercise 6 to 10 percent and redo the analysis.
9. Change the recurring costs in Problem and Exercise 6 to $40,000 and redo the analysis.
10. Change the time horizon in Problem and Exercise 6 to three years and redo the analysis.
11. Assume monetary benefits of an information system of $40,000 the first year and increasing benefits of $10,000 a year for the next five years (year 1 = $50,000, year 2 = $60,000, year 3 = $70,000, year 4 = $80,000, year 5 = $90,000). One-time development costs were $80,000 and recurring costs were $45,000 over the duration of the system's life. The discount rate for the company was 11 percent. Using a six-year time horizon, calculate the net present value of these costs and benefits. Also, calculate the overall return on investment and then present a break-even analysis. At what point does break-even occur?
12. Change the discount rate for Problem and Exercise 11 to 12 percent and redo the analysis.
13. Change the recurring costs in Problem and Exercise 11 to $40,000 and redo the analysis.
14. For the system you chose for Problem and Exercise 3, complete section 1.0.A, the project overview, of the baseline project plan report. How important is it that this initial section of the baseline project plan report be done well? What could go wrong if this section is incomplete or incorrect?

15. For the system you chose for Problem and Exercise 3, complete section 2.0.A, the alternatives, of the baseline project plan report. Without conducting a full-blown feasibility analysis, what is your gut feeling as to the feasibility of this system?
16. For the system you chose for Problem and Exercise 3, complete section 3.0.A–F, the feasibility analysis, of the baseline project plan report. How does this feasibility analysis compare with your gut feeling from the previous question? What might go wrong if you rely on your gut feeling in determining system feasibility?
17. For the system you chose for Problem and Exercise 3, complete section 4.0.A–C, management issues, of the baseline project plan report. Why might people sometimes feel that these additional steps in the project plan are a waste of time? What could you say to convince them that these steps are important?

Discussion Questions

1. Imagine that you are the chief information officer (CIO) of a company and are responsible for making all technology investment decisions. Would you ever agree to build an information system that had a negative net present value? If so, why? If not, why not? How would you justify your decision?
2. Imagine that you are interviewing for a job when the interviewer asks you which cost-benefit analysis technique is best for assessing a project's economic feasibility. What would your response be?
3. Imagine you are a member of the project approval committee. An ambitious young manager in the marketing department is well connected with the top management team in your company. He catches you in the hall and mentions that he is frustrated with how long it takes to get a simple system enhancement through the "bureaucratic" approval process. He wonders whether you could sign off on a small enhancement request for his team's reporting application. With a wink, he promises to "owe you one." What would you say to him and why?
4. Of the six methods for assessing project feasibility, which is the most important? In which situation is each method more or less important?

Case Problems

1. Pine Valley Furniture

Pine Valley Furniture recently implemented a new internship program and has begun recruiting interns from nearby university campuses. As part of this program, interns have the opportunity to work alongside a systems analyst. This shadowing opportunity provides invaluable insights into the systems analysis and design process. Recently you were selected for a six-month internship at Pine Valley Furniture, and Jim Woo has been assigned as your supervisor.

At an initial meeting with Jim Woo, he explains that Pine Valley Furniture is currently involved with two important systems development projects, the Customer Tracking System and WebStore. The purpose of the Customer Tracking System is to enable the PVF marketing group to track customer purchase activity and sales trends better. The WebStore project will help move the company into the twenty-first century by facilitating online furniture purchases, with an initial focus on corporate furniture buying. During your meeting with Mr. Woo, he reviews the documentation assembled for both systems. Mr. Woo hands you a copy of the Customer Tracking System's economic feasibility analysis. He mentions that he would like to modify the spreadsheet to reflect the information provided in the following table. Because you are familiar with a spreadsheet product, you volunteer to make the modifications for him.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Net economic benefit	$ 0	$50,000	$50,000	$50,000	$50,000	$50,000
One-time costs	$47,500					
Recurring costs	$ 0	$32,000	$32,000	$32,000	$32,000	$32,000

a. How were Pine Valley Furniture's projects initiated? What is the focus for each of the new systems?

b. Modify the Customer Tracking System's economic feasibility analysis to reflect the modifications mentioned in this case problem. Use a discount rate of 10 percent. After the changes are made, what are the new overall NPV, ROI, and break-even point?
c. Modify the worksheet created in part b using discount rates of 12 and 14 percent. What impact do these values have on the overall NPV, ROI, and break-even point?
d. Jim Woo would like to investigate how other online stores are targeting the business furniture market. Identify and evaluate two online stores that sell business furniture. Briefly summarize your findings.

2. Hoosier Burger

The Hoosier Burger project development team has met several times with Bob and Thelma Mellankamp. During these meetings, Bob has stressed the importance of improving Hoosier Burger's inventory control, customer ordering, and management reporting systems. Demand for Hoosier Burger food is at an all-time high, and this increased demand is creating problems for Hoosier Burger's staff, creating stock-out problems and impacting sales.

During rush periods, customers sometimes wait fifteen minutes to place an order and may wait an additional twenty-five minutes to receive their order. Low-in-stock inventory items are often not reordered in a timely fashion, thus creating problems with the food preparation. For instance, vanilla ice cream is used to prepare vanilla malts, an item that accompanies the Hoosier Burger Special. Last week, Bob did not order enough vanilla ice cream, resulting in a last-minute dash to the grocery store.

Bob and Thelma have expressed their feelings that a new information system will be beneficial in the areas of inventory management, marketing, customer service, and food preparation. Additionally, the project team discussed with Bob and Thelma the possibility of implementing a point-of-sale system as an alternative design strategy.

a. How was the Hoosier Burger project identified and selected? What focus will the new system have?
b. Identify the Hoosier Burger project's scope.
c. Using the six feasibility factors presented in the chapter, assess the Hoosier Burger project's feasibility.
d. Using Figure 4-13 as a guide, develop a project scope statement for the Hoosier Burger project.

3. American Labs

American Labs provides lab testing services for a variety of clients, mostly doctors' offices and other small medical businesses throughout the Midwest. Clients send test vials containing blood samples or other test requests to American Labs' testing center, where the requested tests are performed, after which the results are sent back to the client via fax.

Jim Larsen, the head technician in the testing facility at American Labs has approached you for help with the company's outdated inventory tracking system. Business has picked up recently, and the turnaround for clients' requested tests has been lengthening. To make matters worse, the lab technicians are seldom able to give customers an answer regarding where their requests fall in the testing queue or how long they can expect the turnaround to be. Much of this stems from an old, mostly paper-based inventory tracking system, which includes hand-written labels put on each of the incoming test vials and a logbook with entries made for each vial at each stage of the testing process.

Jim would like to streamline the inventory tracking process with an updated information system that uses barcodes and a modern database to keep track of customer test requests and the accompanying vials. He would like to enable technicians to provide accurate status updates and turnaround estimates, and generally shorten the turnaround time for test requests.

After an initial analysis, you make the following estimations. You will use these data as part of your initial feasibility assessment.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Net economic benefit	$0	$50,000	$50,000	$50,000	$50,000	$50,000
One-time costs	$80,000					
Recurring costs	$0	$25,000	$25,000	$25,000	$25,000	$25,000

a. Identify several benefits and costs associated with implementing this new system.
b. Using Figure 4-10 as a guide, prepare an economic feasibility analysis worksheet for American Labs. Using a discount rate of 10 percent, what are the overall NPV and ROI? When will break-even occur?
c. Modify the spreadsheet developed for part b to reflect discount rates of 11 and 14 percent. What impact will these new rates have on the economic analysis?

CASE: PETRIE'S ELECTRONICS

Systems Planning and Selection

Now that the "No Customer Escapes" project team has been formed and a plan has been developed for distributing project information, Jim began working on the project scope statement, workbook, and baseline project plan. He first drafted the project scope statement and posted it on the project's intranet (see PE Figure 4-1). Once posted on the intranet, he sent a short e-mail message to all team members requesting feedback. Minutes after sending the e-mail, Jim's office phone rang.

"Jim, it's Sally. I just looked over the scope statement and have a few comments."

"Great," replied Jim, "it's just a draft. What do you think?"

"Well, I think that we need to explain more about how the system will work and why we think this new system will more than pay for itself."

"Those are good suggestions; I am sure many others will also want to know that information. However, the scope statement is a pretty high-level document and doesn't get into too much detail. Basically, its purpose is to just formally announce the project, providing a very high-level description as well as briefly listing the objectives, key assumptions, and stakeholders. The other documents that I am working on, the workbook and the baseline project plan, are intended to provide more details on specific deliverables, costs, benefits, and so on. So, anyway, that type of more detailed information will be coming next."

"Oh, OK, that makes sense. I have never been on a project like this, so this is all new to me," said Sally.

"Don't worry," replied Jim, "getting that kind of feedback from you and the rest of the team will be key for us doing a thorough feasibility analysis. I am going to need a lot of your help in identifying possible costs and benefits of the system. When we develop the baseline project plan, we do a very thorough feasibility analysis—we examine financial, technical, operational, schedule, legal and contractual feasibility, as well as potential political issues arising through the development of the system."

"Wow, we have to do all that? Why can't we just build the system? I think we all know what we want," replied Sally.

"That is another great question," replied Jim. "I used to think exactly the same way, but what I learned in my last job was that there are great benefits to following a fairly formal project management process with a new system. By moving forward with care, we are much more likely to have the right system, on time and on budget."

"So," asked Sally, "what is the next step?"

"Well, we need to do the feasibility analyses I just mentioned, which become part of the project's baseline project plan. Once this is completed, we will have a walkthrough presentation to management to make sure they agree with and understand the scope, risks, and costs associated with making 'No Customer Escapes' a reality," said Jim.

"This is going to be a lot of work, but I am sure I am going to learn a lot," replied Sally.

"So, let me get to work on the feasibility analyses," said Jim. "I will be sending requests out to all the team members to get their ideas. I should have this e-mail ready within an hour or so."

"Great, I'll look for it and respond as soon as I can," answered Sally.

"Thanks, the faster we get this background work done, the sooner we will be able to move on to what the system will do," replied Jim.

"Sounds good, talk to you later. Bye," Sally said.

"Bye Sally, and thanks for your quick feedback," answered Jim.

Case Questions

1. Look over the scope statement (PE Figure 4-1). If you were an employee at Petrie's Electronics, would you want to work on this project? Why or why not?
2. If you were part of the management team at Petrie's Electronics, would you approve the project outlined in the scope statement in PE Figure 4-1? What changes, if any, need to be made to the document?
3. Identify a preliminary set of tangible and intangible costs you think would occur for this project and the system it describes. What intangible benefits do you anticipate for the system?
4. What do you consider to be the risks of the project as you currently understand it? Is this a low-, medium-, or high-risk project? Justify your answer. Assuming you were part of Jim's team, would you have any particular risks?
5. If you were assigned to help Jim with this project, how would you utilize the concept of incremental commitment in the design of the baseline project plan?