Chapter 2

PLANNING

CHAPTER OUTLINE

After studying this chapter, students will be able to understand the:

- System Development Projects: Identification and Selection
- System Development Projects: Initiation and Planning

Identifying and Selecting Systems Development Projects

The scope of information systems today is the whole enterprise. Managers, knowledge workers, and all other organizational members expect to easily access and retrieve information, regardless of its location. Nonintegrated systems used in the past (islands of information) are being replaced with cooperative, integrated enterprise systems that can easily support information sharing. The clear direction for information systems development is building bridges between these islands. Obtaining integrated enterprise-wide computing presents significant challenges for both corporate and information system management.

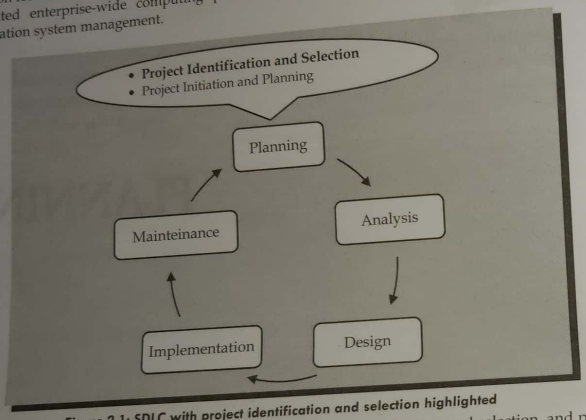

Figure 2.1: SDLC with project identification and selection highlighted

The first phase of the SDLC is planning, consisting of project identification and selection, and project initiation and planning as illustrated in figure 2.1. During project identification and selection, a senior manager, a business group, an IS manager, or a steering committee identifies and assesses all possible systems development projects that an organization unit could undertake. Next, those projects deemed most likely to yield significant organizational benefits, given available resources, are selected for subsequent development activities. Organizations vary in their approach to identifying and selecting projects. In some organizations, project identification and selection is a very formal process in which projects are outcomes of a larger overall planning process.

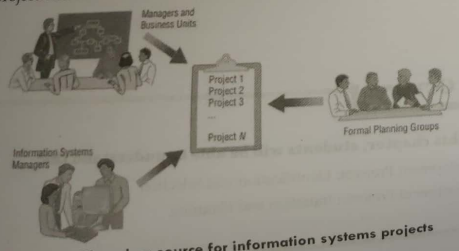

Figure 2.2: Three key source for information systems projects

Information systems development requests come from a variety of sources which is illustrated in figure 2.2. One source is requests by managers and business units for replacing or extending an existing system to gain needed information or to provide a new service to customers. Another source for requests is IS managers who want to make a system more efficient and less costly to operate, or want to move it to a new operating environment. A final source of projects is a formal planning group that identifies projects for improvement to help the organization meet its corporate objectives (e.g., a new system to provide better customer service). Regardless of how a given organization actually 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.

Process of Identifying and Selecting IS Development Projects

Project identification and selection consists of three primary activities as illustrated in figure 2.3:

1. **Identifying potential development projects**
2. **Classifying and ranking projects**
3. **Selecting projects for development**

Each of these activities is described below.

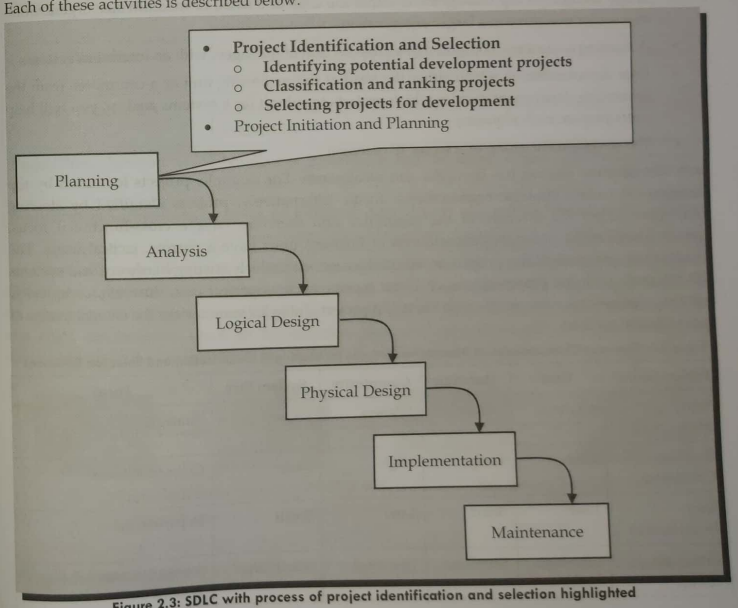

Figure 2.3: SDLC with process of project identification and selection highlighted

1. Identifying Potential Development Projects

Organizations vary as to how they identify projects.

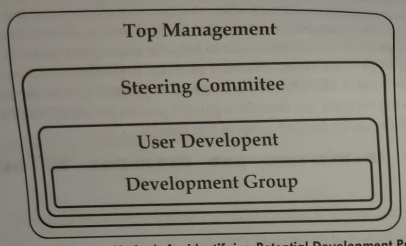

Figure 2.4: Selection Methods for Identifying Potential Development Projects

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 2.1 summarizes the characteristics of each selection method.

Table 2.1: Common Characteristics of Alternative Methods for Making IS 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 Development	Low	Short	Low	Small	Departmental
Development Group	Low-high	Shot-long	Low-high	Small-large	Integration with existing systems

2. Classifying and Ranking 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 2.2 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.

Table 2.2: 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
Strategic Alignment	Extent to which the project is viewed as helping the organization activities 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 successfully complete the project within given time and resource constraints

An important project evaluation method that is widely used for assessing information systems development projects is called **value chain analysis**. Value chain analysis is the process of analyzing an organization's activities for making products and/or services to determine where value is added and costs are incurred. Once an organization gains a clear understanding of its value chain, improvements in the organization's operations and performance can be achieved.

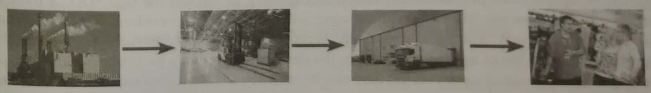

Figure 2.5: Organizations can be thought of as a value chain, transforming raw materials into products for customers

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 2.6. 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

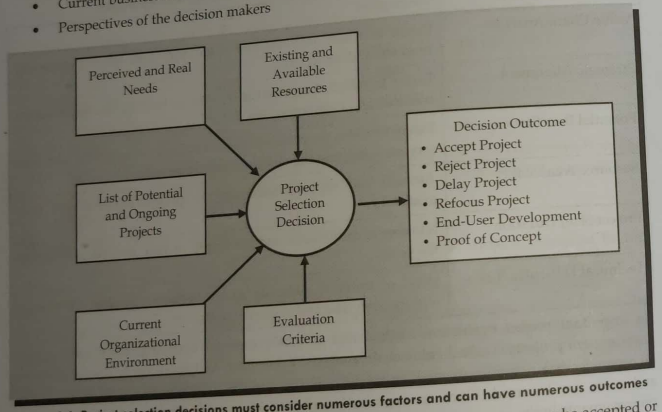

Figure 2.6: Project selection decisions must consider numerous factors and can have numerous outcomes

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 2.7. An outcome of this activity is the assurance that people in the organization gave careful 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** is a strategy in system analysis and design in which the project is reviewed after each phase and continuation of the project is rejustified in each of these reviews. 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.

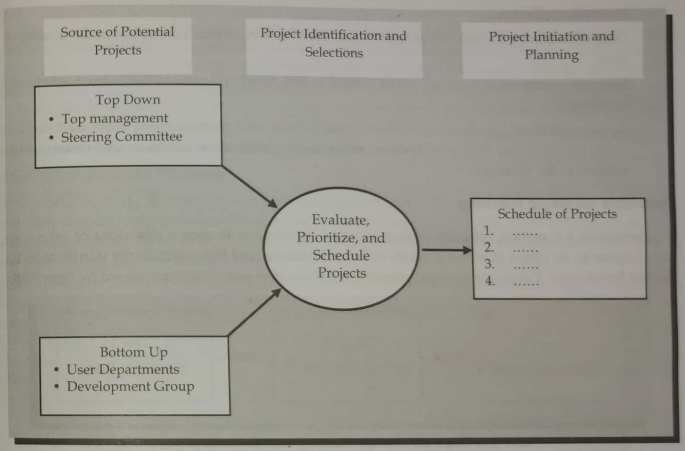

Figure 2.7: IS development projects come from both top-down and bottom-up initiatives

Many Organizations have found in order to make good project selection decisions and provide sound guidance as issue arise in your work as a systems analyst on a project, a clear understanding of overall organizational business strategy and objectives is required. This means that a clear understanding of the business and the desired role of information systems in achieving organizational goals is a precondition to improving the identification and selection process.

CORPORATE AND INFORMATION SYSTEMS PLANNING

Although there are numerous motivations for carefully planning the identification and selection of projects, organizations have not traditionally used systematic planning process when determining how to allocate IS resources. Instead, projects have often resulted from attempts to solve isolated organizational problems. In effect, organizations have asked the question: What procedure (application program) is required to solve this particular problem as it exists today? The difficulty with this approach is that the required organizational procedures are likely to change over time as the environment changes. For example, a company may decide to change its method of billing

customers or a university may change its procedure for registering students. When such changes occur, it is usually necessary to again modify existing information systems.

The need for improved information systems projects identification and selection is readily apparent when we consider factors such as:

1. The cost of information systems has risen steadily and approaches 40 percent of total expenses in some organizations.
2. Many systems cannot handle applications that cross organizational boundaries.
3. Many systems often do not address the critical problems of the business as a whole or support strategic applications.
4. Data redundancy is often out of control, and users may have little confidence in the quality of data.
5. Systems maintenance costs are out of control as old, poorly planned systems must constantly be revised.
6. Application backlogs often extend three years or more, and frustrated end users are forced to create (or purchase) their own systems, often creating redundant databases and incompatible systems in the process.

Corporate Strategic Planning

A prerequisite for making effective project selection decisions is to gain a clear idea of where an organization is, its vision of where it wants to be in the future, and how to make the transition to its desired future state. Corporate strategic planning is a three-step process as represented by figure 2.8.

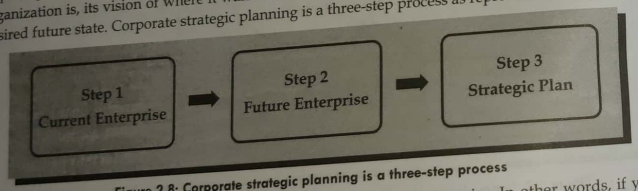

Figure 2.8: Corporate strategic planning is a three-step process

The first step focuses on gaining an understanding of the current enterprise. In other words, if you don't know where you are, it is impossible to tell where you are going. Next, top management must determine where it wants the enterprise to be in the future. Finally, after gaining an understanding of the current and future enterprise, a strategic plan can be developed to guide this transition.

Corporate strategic planning is an ongoing process that defines the mission, objectives, and strategies of an organization. During corporate strategic planning, executives typically develop a mission statement, statements of future corporate objectives, and strategies designed to help the organization reach its objectives. The **mission statement** of a company typically states in very simple terms what business the company is in. After defining its mission, an organization can then define its objectives. **Objective statements** refer to "broad and timeless" goals for the organization. These goals can be expressed as a series of statements that express an organization's qualitative and quantitative goals for reaching a desired future position. A **competitive strategy** is the method by which an organization attempts to achieve its mission and objectives. Table 2.3 summarizes the generic competitive strategies.

Table 2.3: Generic Competitive Strategies

Strategy	Description
Low-Cost Producer	This strategy reflects competing in an industry on the basis of product or service cost to the consumer. For example, in the automobile industry, the South Korean–produced Hyundai is a product line that competes on the basis of low cost.
Product Differentiation	This competitive strategy reflects capitalizing on a key product criterion requested by the market (for example, high quality, style, performance, roominess). In the automobile industry, many manufacturers are trying to differentiate their products on the basis of quality.
Product Focus or Niche	This strategy is similar to both the low-cost and differentiation strategies but with a much narrower market focus. For example, a niche market in the automobile industry is the convertible sports car market. Within this market, some manufacturers may employ a low-cost strategy and others may employ a differentiation strategy based on performance or style.

To make the long story short, we say: To build the most effective information systems, it is only through the clear understanding of organizational mission, objectives, and strategies that IS development projects should be identified and selected.

Information Systems Planning

The second planning process that can play a significant role in the quality of project identification and selection decisions is called information systems planning (ISP). ISP is an orderly means of assessing the information needs of an organization and defining the information systems, databases, and technologies that will best satisfy those needs.

The three key activities of this modeling process are represented in figure 2.9. Like corporate strategic planning, ISP is a three-step process in which the first step is to assess current IS-related assets—human resources, data, processes, and technologies. Next, target blueprints of these resources are developed. These blueprints reflect the desired future state of resources needed by the organization to reach it objectives as defined during strategic planning. Finally, a series of scheduled projects is defined to help move the organization from its current to its future desired state. These three activities parallel those of corporate strategic planning, and this relationship is shown in figure 2.10.

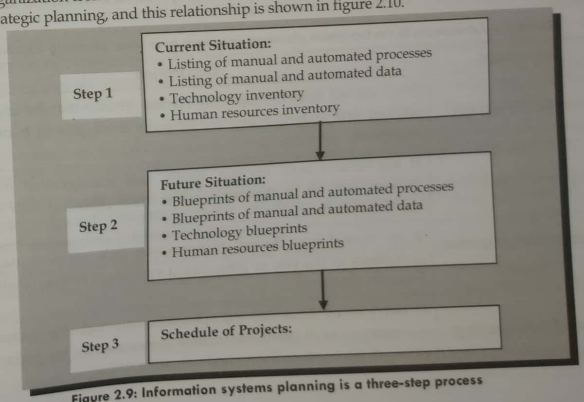

Figure 2.9: Information systems planning is a three-step process

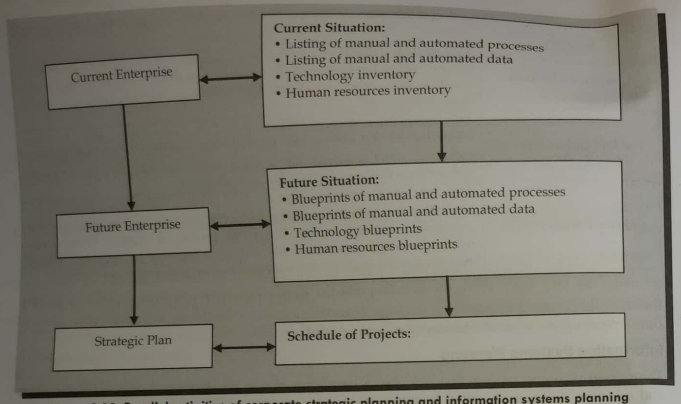

Figure 2.10: Parallel activities of corporate strategic planning and information systems planning

Numerous methodologies such as Business Systems Planning (BSP) and Information Engineering (IE) have been developed to support the ISP process; most contain the following three key activities:

1. **Describing Current Situation.**

The most widely used approach for describing the current organizational situation is generically referred to as top-down planning. **Top-down planning** is a generic ISP methodology that attempts to gain a broad understanding of the informational needs of the entire organization. The top-down approach to ISP has several advantages over other planning approaches, which are summarized in table 2.4.

Table 2.4: Advantages to the top-down planning approach over other planning approaches

Advantages	Description
Broader Perspective	If not viewed from the top, information systems may be implemented without first understanding the business from general management's viewpoint.
Improved Integration	If not viewed from the top, totally new management information systems may be implemented rather than planning how to evolve existing systems.
Improved Management Support	If not viewed from the top, planners may lack sufficient management acceptance of the role of information systems in helping them achieve business objective.
Better Understanding	If not viewed from the top, planners may lack the understanding necessary to implement information systems across the entire business rather than simply to individual operating units.

In contrast to the top-down planning approach, a bottom-up planning approach requires the identification of business problems and opportunities that are used to define projects. Using the bottom-up approach for creating IS plans can be faster and less costly than using the top-down approach; it also has the advantage of identifying pressing organizational problems. **Bottom-up planning** is a generic information systems planning methodology that identifies and defines IS development projects based upon solving operational business problems or taking advantage of some business opportunities.

2. **Describing the Target Situation, trends, and Constraints**

After describing the current situation, the next step in the ISP process is to define the target situation that reflects the desired future state of the organization. This means that the target situation consists of the desired state of the locations, units, functions, processes, data, and IS (see figure 2.9).

In summary, to create the target situation, planners must first edit their initial lists and record the desired locations, units, functions, processes, data, and information systems within the constraints and trends of the organization environment (e.g., time, resources, technological evolution, competition, and so on). Next, matrices are updated to relate information in a manner consistent with the desired future state. Planners then focus on the differences between the current and future lists and matrices to identify projects and transition strategies.

3. **Developing a Transition Strategy and Plans.**

Once the creation of the current and target situations is complete, a detailed transition strategy and plan are developed by the IS planning team. This plan should be very comprehensive, reflecting broad, long-range issues in addition to providing sufficient detail to guide all levels of management concerning what needs to be done, how, when, and by whom in the organization. The components of a typical information systems plan are explained below:

- **Organizational Mission, Objectives, and Strategy:** Briefly describes the mission, objectives, and strategy of the organization. The current and future views of the company are also briefly presented (i.e., where we are, where we want to be).
- **Informational Inventory:** This section provides a summary of the various business processes, functions, data entities, and information needs of the enterprise. This inventory will view both current and future needs.
- **Mission and Objectives of IS:** Description of the primary role IS will play in the organization to transform the enterprise from its current to future state. While it may later be revised, it represents the current best estimate of the overall role for IS within the organization. This role may be as a necessary cost, an investment, or a strategic advantage, for example.
- **Constraints on IS Development:** Briefly describes limitations imposed by technology and current level of resources within the company—financial, technological, and personnel.
- **Overall Systems Needs and Long-Range IS Strategies:** Presents a summary of the overall systems needed within the company and the set of long-range (2–5 years) strategies chosen by the IS department to fill the needs.
- **The Short-Term Plan:** Shows a detailed inventory of present projects and systems and a detailed plan of projects to be developed or advanced during the current year. These projects may be the result of the long-range IS strategies or of requests from managers that have already been approved and are in some stage of the life cycle.
- **Conclusions:** Contains likely but not-yet certain events that may affect the plan, an inventory of business change elements as presently known, and a description of their estimated impact on the plan.

Initiating and Planning Systems Development Projects

During the first phase of the SDLC planning, two primary activities are performed as illustrated in figure 2.11. The first, project identification and selection, focuses on the activities during which the need for a new or enhanced system is recognized but does not deal with a specific project but rather identifies the portfolio of projects to be under taken by the organization. Thus, project identification and selection is often thought of as a "pre-project" step in the life cycle. Regardless of how a project is identified and selected, the next step is to conduct a more detailed assessment during project **initiating and planning**. This assessment does not focus on how the proposed system will operate but rather on understanding the scope of a proposed project and its feasibility of completion given the available resources. It is crucial that organizations understand whether resources should be devoted to a project; otherwise, very expensive mistakes can be made. Project initiation and planning is where projects are accepted for development, rejected, or redirected. This is also where a systems analyst, begin to play a major role in the systems development process.

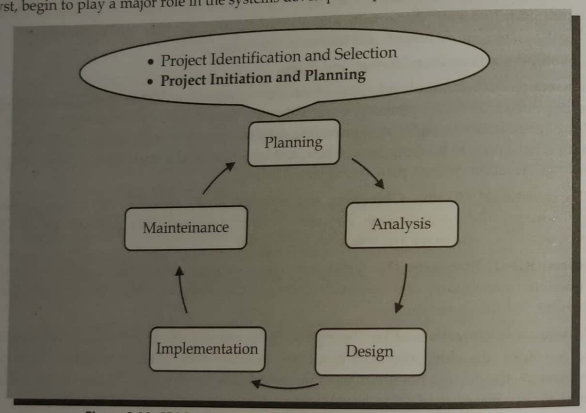

Figure 2.11: SDLC with project initiation and planning highlighted

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 2.12. 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.

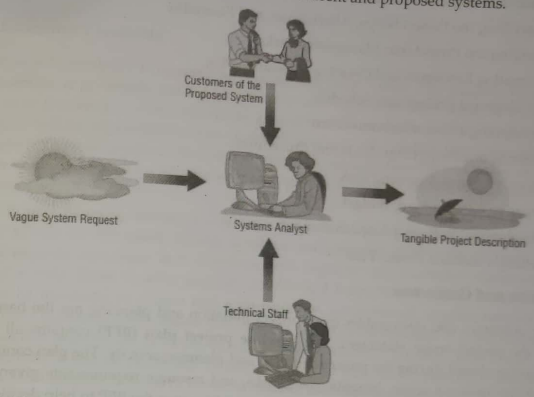

Figure 2.12: The systems analyst transforms a vague system request into a tangible project description during project initiation and planning

Process of Initiating and Planning IS 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. Summary of six activities performed during project initiation are listed below.

- 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

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**. The range of activities performed during project planning is listed below.

- 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 the Project Scope Statement
- Setting a Baseline Project Plan

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 scope, benefits, costs, risks, and resource requirements given the current understanding of the project. 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.

The **Project Scope Statement (PSS)** is a short document prepared for the customer that describes what the project will deliver and outlines all work required to complete the project. The PSS ensures that both you and your customer gain a common understanding of the project. It is also a very useful communication tool. The PSS is a very easy document to create because it typically consists of a high-level summary of the BPP information. Alternatively, an internal development group may develop a PSS that is only one to two pages in length and is intended to inform customers rather than to set contractual obligations and deadlines.

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 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 categories:

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

Together, the culmination of these feasibility analyses forms the business case that justifies the expenditure of resources on the project. In the remainder of this section, we will examine various feasibility issues.

Assessing Economic Feasibility

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.

Determining Project Benefits: Information systems 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. **Tangible benefits** refer to items 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 percentage 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:

- 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

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:

- Competitive necessity
- More timely information
- Improved organizational planning
- Increased organizational flexibility
- Promotion of organizational learning and understanding
- Availability of new, better, or more information
- Ability to investigate more alternatives
- Faster decision making
- More confidence in decision quality
- Improved processing efficiency

- Improved asset utilization
- Improved resource control
- Increased accuracy in clerical operations
- Improved work process that can improve employee morale or customer satisfaction
- Positive impacts on society
- Improved social responsibility
- Better usage of resources ("greener")

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. One goal of a cost–benefit analysis is to accurately determine the **total cost of ownership (TCO)** for an investment. **TCO** refers to the cost of owning and operating a system, including the total cost of acquisition, as well as all costs associated with its ongoing use and maintenance. 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:

- 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. 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, datacenter 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.

The Time Value of Money: Most techniques used to determine economic feasibility encompass the concept of the **time value of money (TVM)** which 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 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. The rate at which money can be borrowed or invested is referred to as the **cost of capital**, and is called the **discount rate** for TVM calculations. Some of the costs of the system will be accrued in after implementation. Before cost-benefit analysis, these costs should be brought back to the current dollars. **Present value** is the current value of a dollar at any time in the future. It is calculated using the formula:

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

Where PV_n is the present value of Y dollars n years for now when i is the discount rate. To calculate **net present value (NVP),** simply add the present values calculated previously.

The objective of the **break-even analysis** is to discover at what point (if ever) benefits equal costs (i.e., when breakeven occurs). To conduct this analysis, the NPV of the yearly cash flows are 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 flow reflects the total cash flows for all preceding years.

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

A graphical representation of this analysis is shown in figure 2.13. 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 CTS. It should be clear from this analysis that, without such information, it would be virtually impossible to know the cost–benefits of a proposed system and impossible to make an informed decision regarding approval or rejection of the service request. A system analyst 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 TVM. Some of these cost–benefit analysis techniques are quite simple; whereas others are more sophisticated. Table 2.5 describes three commonly used techniques for conducting economic feasibility analysis.

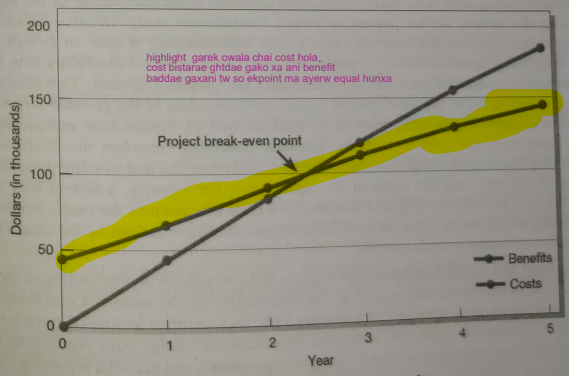

Figure 2.13: Break-even analysis example

Table 2.5: Commonly used economical cost-benefit analysis techniques

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 of 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.

A systems project, 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 2.13 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. Systems analyst must, be as precise as can be 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.

Assessing Other Feasibility Concerns

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.

Building and Reviewing the Baseline Project Plan

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. 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 table 2.6, contains four major sections:

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

Table 2.6: Outline of a baseline project plan

BASELINE PROJECT PLAN REPORT
1.INTRODUCTION • 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. • Recommendation: Provides a summary of important findings from the planning process and recommendations for subsequent activities.
2. SYSTEM DESCRIPTION • Alternatives: Provides a brief presentation of alternative system configurations. • System Description: Provides a description of the selected configuration and a narrative of input information, tasks performed, and resultant information.
3. FEASIBILITY ASSESSMENT • Economic Analysis: Provides an economic justification for the system using cost-benefit analysis. • Technical Analysis: Provides a discussion of relevant technical risk factors and an overall risk rating of the project. • 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. • 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). • Political Analysis: Provides a description of how key stakeholders within the organization view the proposed system. • Schedules, Time Line, and Resource Analysis—Provides a description of potential timeframe and completion date scenarios using various resource allocation schemes.

4. MANAGEMENT ISSUES
- Team Configuration and Management: Provides a description of the team member roles and reporting relationships.
- Communication Plan: Provides a description of the communication procedures to be followed by management, team members, and the customer.
- Project Standards and Procedures: Provides a description of how deliverables will be evaluated and accepted by the customer.
- Other Project-Specific Topics: Provides a description of any other relevant issues related to the project uncovered during planning.

The Introduction Section of the Baseline Project Plan: 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 entire introduction section is often limited to only a few pages. Although the Introduction section 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 activity that should be performed initially is the definition of project scope.

The System Description Section of the Baseline Project Plan: The second section of the BPP is the System Description, which contains an outline of possible alternative solutions in addition to the one deemed most appropriate for the given situation. Note that this description is at a very high level and mostly narrative in form. The following examples demonstrate that alternatives may be stated simply:

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 analysis phase and evaluate in greater depth these and other alternative directions for the system.

The Feasibility Assessment Section of the Baseline Project Plan: In the third section, Feasibility Assessment, issues related to project costs and benefits, technical difficulties, and other such concerns are outlined. This is also the section where high level project schedules are specified using network diagrams and Gantt charts. During project initiation and planning, task and activity estimates are not generally detailed. An accurate work breakdown can be done only for the next one or two life cycle activities. 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 is primarily concerned with gaining rough estimates of the human resource requirements because people are the most expensive resource element. Once systems analyst defines 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 you change the scope of the project. The greatest amount of project planning effort is typically expended on these Feasibility Assessment activities.

The Management Issues Section of the Baseline Project Plan: The final section, Management Issues, outlines a number of managerial concerns related to the project. This will be a very 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. In the Communications Plan portion, you explain how the user will be kept informed about project progress (such as periodic review meetings or even a newsletter) and what mechanisms will be used to foster sharing of ideas among team members, such as some form of computer-based conference facility. 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.

Reviewing the Baseline Project Plan

Before the next phase of the SDLC can begin, the users, management, and development group must review the BPP in order to verify that it makes sense. This review takes place before the BPP is submitted or presented to a 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 that all relevant parties understand and agree with the information contained in the BPP. A common method for performing this review (as well as reviews during subsequent life cycle phases) is called a **structured walk-through**. **Walk-throughs** are peer group reviews of any product created during the systems development process and are widely used by professional development organizations. Experience has shown that walk-throughs are a very effective way to ensure the quality of an information system and have become a common day-to-day activity for many systems analysts.

Most walk-throughs are not rigidly formal or exceedingly long in duration. It is important, however, to establish a specific agenda for the walk-through so that all attendees understand what is to be covered and the expected completion time. At walk-through meetings, there is a need to have individuals play specific roles. These roles are as follows:

- **Coordinator.** This person plans the meeting and facilitates a smooth meeting process. 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 it may be one of the analysts on the team.
- **Standards bearer.** The role of this person is to ensure 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.

These standards bearers 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.*

Walk-through meetings are a common occurrence in most systems development groups and can be used for more activities than reviewing the BPP, including the following:

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

One of the key advantages in using a structured review process is it ensures 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 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.

Walk-throughs 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 Power Point 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 well-planned, well-designed, and well-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, which are outlined in table 2.7.

Table 2.7: Guideline 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 like 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 spellchecker alone.	Make sure you carefully review your presentation for typographical and wording 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.
Use supplemental materials appropriately.	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.
Deliver the information effectively.	To make an effective presentation, you must become an effective public speaker through practice.
Personal appearance matters.	Your appearance and demeanor can go a long way toward enhancing how the audience receives your presentation.

EXERCISE

1. Describe the project identification and selection process.
2. Describe several project evaluation criteria.
3. Describe value chain analysis and how organizations use tis technique to evaluate and compare projects.
4. Discuss several factors that provide evidence for the need for improved ISP today.
5. Describe the steps involved in corporate strategic planning.
6. What are the three generic competitive strategies?
7. List and describe the advantages of top-down planning over other planning approaches.
8. Write a mission statement for a business that you would like to start. The mission statement should state the area of business you will be in and what aspect of the business you value highly.
9. List and describe the steps in the project initiation and planning process.
10. What is contained in a BPP? Are the content and format of all baseline plan the same? Why or why not?
11. Write and discuss the different types of project feasibility factors.
12. Is any feasibility factor most important? Why or why not?
13. Describe three commonly used methods for performing economic cost-benefit analysis.
14. What intangible benefits might an organization obtain from the development of an information system?
15. What are the types or categories of benefits of an IS project?
16. 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?
17. Describe the structured walk-through process.
18. What roles need to be performed during a walk-through?
19. 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 breakeven occur?

20. Write short notes on:
    a. Mission
    b. Objective statements
    c. Competitive strategy
    d. Corporate strategic planning
    e. Top-down panning
    f. Bottom-up planning
    g. Low-cost producer
    h. Information System Planning
    i. Value Cain Analysis
    j. Break-even analysis
    k. Baseline Project Plan (BPP)
    l. Discount rate
    m. Economic Feasibility
    n. Business case
    o. One-time cost
    p. Project Scope Statement (PSS)
    q. Total cost of ownership (TCO)

❐❐❐