An Overview of Part Two

The demand for new or replacement systems exceeds the ability and resources of most organizations to conduct systems development projects either by themselves or with consultants. This means that organizations must set priorities and a direction for systems development that will yield development projects with the greatest net benefits. As a systems analyst, you must not only analyze user information requirements, but also help make the business case, or justify why the system should be built and the development project conducted.

The reason for any new or improved information system is to add value to the organization. As systems analysts, we must choose to use systems development resources to build the mix of systems that add the greatest value to the organization. How can we determine the business value of systems and identify those applications that provide the most critical gains? Part Two addresses this topic, the first phase of the systems development life cycle (SDLC), which we call planning. Business value comes from supporting the most critical business goals and helping the organization deliver on its business strategy. All systems, whether supporting operational or strategic functions, must be linked to business goals. The two chapters in this part of the book show how to make this linkage.

The source of systems projects is either initiatives from information systems planning (proactive identification of systems) or requests from users or IS professionals (reactions to problems or opportunities) for new or enhanced systems. In Chapter 4, we outline the linkages among corporate planning, information systems planning, and the identification and selection of projects. We do not include IS planning as part of the SDLC, but the results of IS planning greatly influence the birth and conduct of systems projects. Chapter 4 makes a strong argument that IS planning provides not only insights into choosing which systems an organization needs, but also describes the strategies necessary for evaluating the viability of any potential systems project.

A more frequent source of project identification originates from system service requests (SSRs) from business managers and IS professionals, usually for very focused systems or incremental improvements in existing systems. Business managers request a new or replacement system when they believe that improved information services will help them do their jobs. IS professionals may request system updates when technological changes make current system implementations obsolete or when the performance of an existing system needs improvement. In either case, the request for service must be understood by management and a justification for the system and associated project must be developed.

We continue with the Broadway Entertainment Company (BEC) case following Chapter 4. In this case, we show how an idea for a new information system was stimulated by a synergy between corporate strategic planning and the creativity of an individual business manager. We also show how this idea is initially evaluated and how it leads to the initiation of a systems development project.

Chapter 5 focuses on what happens after a project has been identified and selected: the next step in making the business case, initiating and planning the proposed system request. This plan develops a better understanding of the scope of the potential system change and the nature of the needed system features. From this preliminary understanding of system requirements, a project plan is developed that shows both the detailed steps and resources needed in order to conduct the analysis phase of the life cycle and the more general steps for subsequent phases. The feasibility and potential risks of the requested system are also outlined, and an economic cost-benefit analysis is conducted to show the potential impact of the system change. In addition to the economic feasibility or justification of the system, technical, organizational, political,
legal, schedule, and other feasibilities are assessed. Potential risks—unwanted outcomes—are identified, and plans for dealing with these possibilities are identified. Project initiation and planning ends when a formal proposal for the systems development project is completed and submitted for approval to the person who must commit the resources to systems development. If approved, the project moves into the analysis phase of the SDLC.

We illustrate a typical project initiation and planning phase in a BEC case following Chapter 5. In this case, we show how BEC identified one critically important business goal, which provided the motivation for a requested system. The case further shows how an analysis of this business goal leads to the justification for a system with a competitive advantage for BEC and then to the associated development project plan.
Chapter 4

Identifying and Selecting Systems Development Projects

Learning Objectives

After studying this chapter, you should be able to:

- Describe the project identification and selection process.
- Describe the corporate strategic planning and information systems planning process.
- Explain the relationship between corporate strategic planning and information systems planning.
- Describe how information systems planning can be used to assist in identifying and selecting systems development projects.
- Analyze information systems planning matrices to determine affinity between information systems and IS projects and to forecast the impact of IS projects on business objectives.
- Describe the three classes of Internet electronic commerce applications: Internet, intranets, and extranets.

Introduction

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—often referred to as “islands of information”—are being replaced with cooperative, integrated enterprise systems that can easily support information sharing. While the goal of building bridges between these “islands” will take some time to achieve, it represents a clear direction for information systems development. The use of enterprise resource planning (ERP) systems from companies such as SAP (www.sap.com), Oracle (www.oracle.com), and SSA Global (www.ssaglobal.com) has enabled the linking of these “islands” in many organizations. Additionally, as the use of the Internet continues to evolve to support business activities, systems integration has become a paramount concern of organizations (Hasselbring, 2000; King, 2003; Luftman, 2004; Overby, 2006).
Obtaining integrated, enterprise-wide computing presents significant challenges for both corporate and information systems management. For example, given the proliferation of personal and departmental computing wherein disparate systems and databases have been created, how can the organization possibly control and maintain all of these systems and data? In many cases they simply cannot; it is nearly impossible to track who has which systems and what data, where there are overlaps or inconsistencies, and how accurate the information is. The reason that personal and departmental systems and databases abound is that users are either unaware of the information that exists in corporate databases or they cannot easily get at it, so they create and maintain their own information and systems. Intelligent identification and selection of system projects, for both new and replacement systems, are critical steps in gaining control of systems and data. It is the hope of many chief information officers (CIOs) that with the advent of ERP systems, improved system integration, and the rapid deployment of corporate Internet solutions, these islands will be reduced or eliminated (Koch, 2005; Luftman, 2004; Ross and Feeny, 2000).

The acquisition, development, and maintenance of information systems consume substantial resources for most organizations. This suggests that organizations can benefit from following a formal process for identifying and selecting projects. The first phase of the systems development life cycle—project identification and selection—deals with this issue. In the next section, you will learn about a general method for identifying and selecting projects and the deliverables and outcomes from this process. This is followed by brief descriptions of corporate strategic planning and information systems planning, two activities that can greatly improve the project identification and selection process.

**IDENTIFYING AND SELECTING SYSTEMS DEVELOPMENT PROJECTS**

The first phase of the SDLC is planning, consisting of project identification and selection, and project initiation and planning (see Figure 4-1). 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. For example, a large organization may follow a formal project identification process whereby a proposed project is rigorously compared with all competing projects. Alternatively, a small organization may use informal project selection processes that allow the highest-ranking IS manager to independently select projects or allow individual business units to decide on projects after agreeing to provide project funding.

Information systems development requests come from a variety of sources. 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.
The Process of Identifying and Selecting IS Development Projects

Project identification and selection consists of three primary activities:

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

Each of these steps is described below:

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-sized 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 (often you, as a systems analyst, will help users prepare such requests)
   - The development group or a senior IS manager

   All methods of identification have been found to have strengths and weaknesses. Research has found, for example, that projects identified by top management more often have a strategic organizational focus. Alternatively, projects identified by steering committees more often reflect the diversity of the committee and therefore have a cross-functional focus. Projects identified by individual departments or business units most often have a narrow, tactical focus. Finally, a dominant characteristic of projects identified by the develop-
TABLE 4-1 Characteristics of Alternative Methods for Making Information Systems Identification and Selection Decisions

<table>
<thead>
<tr>
<th>Selection Method</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Management</td>
<td>Greater strategic focus, Largest project size, Longest project duration</td>
</tr>
<tr>
<td>Steering Committee</td>
<td>Cross-functional focus, Greater organizational change, Formal cost-benefit analysis, Larger and riskier projects</td>
</tr>
<tr>
<td>User Department</td>
<td>Narrow, nonstrategic focus, Faster development</td>
</tr>
<tr>
<td>Development Group</td>
<td>Integration with existing systems focus, Fewer users, management layers, and business functions, Less concern with cost-benefit analysis</td>
</tr>
</tbody>
</table>

(Source: Adapted from McKeen, Guimaraes, and Wetherbe, 1994.)

ment group is the ease with which existing hardware and systems will integrate with the proposed project. Other factors, such as project cost, duration, complexity, and risk, are also influenced by the source of a given project. Characteristics of each selection method are briefly summarized in Table 4-1. In addition to who makes the decision, characteristics specific to the organization—such as the level of firm diversification, level of vertical integration, or extent of growth opportunities—can also influence any investment or project selection decision (Dewan et al., 1998; Luftman, 2004; Yoo, Sangwan, and Qiu, 2006).

Of all the possible project sources, those identified by top management and steering committees most often reflect the broader needs of the organization. This occurs because top management and steering committees are likely to have a broader 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, business unit, or by the information systems development group are often designed for a particular business need within a given business unit. In other words, these projects may not reflect the overall objectives of the organization. This does not mean that projects identified by individual managers, business units, or the IS development group are deficient, only that they may not consider broader organizational issues. Project initiatives stemming from managers, business units, or the development group are generally referred to as coming from a bottom-up source. These are the types of projects in which you, as a systems analyst, will have the earliest role in the life cycle as part of your ongoing support of users. You will help user managers provide the description of information needs and the reasons for doing the project that will be evaluated in selecting, among all submitted projects, which ones will be approved to move into the project initiation and planning phase of the SDLC.

In sum, projects are identified by both top-down and bottom-up initiatives. The formality of the process of identifying and selecting projects can vary substantially across organizations. Also, because limited resources preclude the development of all proposed systems, most organizations have some process of classifying and ranking the merit of each project. Those projects deemed to be inconsistent with overall organizational objectives, redundant
in functionality to some existing system, or unnecessary will thus be removed from consideration. This topic is discussed next.

2. **Classifying and ranking IS development projects.** The second major activity in the project identification and selection process focuses on assessing the relative merit of potential projects. As with the project identification process, classifying and ranking projects can be performed by top managers, a steering committee, business units, or the IS development group. Additionally, the criteria used when assigning the relative merit of a given project can vary. Commonly used criteria for assessing projects are summarized in Table 4-2. In any given organization, one or several criteria might be used during the classifying and ranking process.

As with the project identification and selection process, the actual criteria used to assess 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 will be 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.

An important project evaluation method that is widely used for assessing information systems development projects is called **value chain analysis** (Porter, 1985; Shank and Govindarajan, 1993). 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. Information systems projects providing the greatest benefit to the value chain will be given priority over those with fewer benefits.

As you might have guessed, information systems have become one of the primary ways for organizations to make changes and improvements in their value chains. Many organizations, for example, are using the Internet to exchange important business information with suppliers and customers, such as orders, invoices, and receipts. To conduct a value chain analysis for an organization, think about an organization as a big input/output process (see Figure 4-2). At one end are the inputs to the organization, for example, supplies that are purchased. Within the organizations, those supplies and resources are integrated in some way to produce products and services. At the other end are the outputs, which represent the products and services that are marketed, sold, and then distributed to customers. In value chain analysis, you must first understand each activity, function, and process where value is or

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**Value chain analysis:** Analyzing an organization’s activities to determine where value is added to products and/or services and the costs incurred for doing so; usually also includes a comparison with the activities, added value, and costs of other organizations for the purpose of making improvements in the organization’s operations and performance.

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

<table>
<thead>
<tr>
<th>Evaluation Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Chain Analysis</td>
<td>Extent to which activities add value and costs when developing products and/or services</td>
</tr>
<tr>
<td>Strategic Alignment</td>
<td>Extent to which the project is viewed as helping the organization achieve its strategic objectives and long-term goals</td>
</tr>
<tr>
<td>Potential Benefits</td>
<td>Extent to which the project is viewed as improving profits, customer service, and so forth and the duration of these benefits</td>
</tr>
<tr>
<td>Resource Availability</td>
<td>Amount and type of resources the project requires and their availability</td>
</tr>
<tr>
<td>Project Size/Duration</td>
<td>Number of individuals and the length of time needed to complete the project</td>
</tr>
<tr>
<td>Technical Difficulty/Risks</td>
<td>Level of technical difficulty to successfully complete the project within given time and resource constraints</td>
</tr>
</tbody>
</table>
should be added. Next, determine the costs (and the factors that drive costs or cause them to fluctuate) within each of the areas. After understanding your value chain and costs, you can benchmark (compare) your value chain and associated costs with those of other organizations, preferably your competitors. By making these comparisons, you can identify priorities for applying information systems projects.

3. Selecting IS development projects. The final activity in the project identification and selection process is the actual selection of projects for further development. Project selection is a process of considering both short- and long-term projects and selecting those most likely to achieve business objectives. Additionally, as business conditions change over time, the relative importance of any single project may substantially change. Thus, the identification and selection of projects is a very important and ongoing activity.

Numerous factors must be considered when making project-selection decisions. Figure 4-3 shows that a selection decision requires that the perceived needs of the organization, existing systems and ongoing projects, resource availability, evaluation criteria, current business conditions, and the perspectives of the decision makers will all play a role in project selection decisions. Numerous outcomes can occur from this decision process. Of course, projects can be accepted or rejected. Acceptance of a project usually means that funding to conduct the next phase of the SDLC has been approved. Rejection means that the project will no longer be considered for development. However, projects may also be conditionally accepted; they 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.

One method for deciding among different projects, or when considering alternative designs for a given system, is illustrated in Figure 4-4. For example, suppose that, for a given system that has been identified and selected, there are three alternative designs that could be pursued—A, B, or C. Let’s also suppose that early planning meetings identified three key system requirements and four key constraints that could be used to help make a decision on which alternative to pursue. In the left column of Figure 4-4, three system requirements and four constraints are listed. Because not all requirements and constraints are of equal importance, they are weighted based on their relative importance. In other words, you do not have to weight requirements and constraints equally; it is certainly possible to make requirements more or less important than constraints. Weights are arrived at in discussions among the

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Weight</th>
<th>Alternative A</th>
<th>Alternative B</th>
<th>Alternative C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Rating</td>
<td>Score</td>
<td>Rating</td>
<td>Score</td>
</tr>
<tr>
<td>Requirements</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real-time data entry</td>
<td>18</td>
<td>90</td>
<td>5</td>
<td>90</td>
</tr>
<tr>
<td>Automatic reorder</td>
<td>18</td>
<td>18</td>
<td>5</td>
<td>90</td>
</tr>
<tr>
<td>Real-time data query</td>
<td>14</td>
<td>14</td>
<td>5</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>122</td>
<td>250</td>
<td>250</td>
</tr>
<tr>
<td>Constraints</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developer costs</td>
<td>15</td>
<td>60</td>
<td>75</td>
<td>45</td>
</tr>
<tr>
<td>Hardware costs</td>
<td>15</td>
<td>60</td>
<td>75</td>
<td>45</td>
</tr>
<tr>
<td>Operating costs</td>
<td>15</td>
<td>75</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>Ease of training</td>
<td>5</td>
<td>25</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>220</td>
<td>165</td>
<td>180</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>342</td>
<td>415</td>
<td>430</td>
</tr>
</tbody>
</table>
Deliverables and Outcomes

The primary deliverable from the first part of the planning phase is a schedule of specific IS development projects, coming from both top-down and bottom-up sources, to move into the next part of the planning phase—project initiation and planning (see Figure 4-5). An outcome of this phase is the assurance that careful consideration was given to project selection, with a clear understanding of how each project can help the analysis team, users, and sometimes managers. Weights tend to be fairly subjective and, for that reason, should be determined through a process of open discussion to reveal underlying assumptions, followed by an attempt to reach consensus among stakeholders. Notice that the total of the weights for both the requirements and constraints is 100 (percent).

Next, each requirement and constraint is rated on a scale of 1 to 5. A rating of 1 indicates that the alternative does not meet the requirement very well or that the alternative violates the constraint. A rating of 5 indicates that the alternative meets or exceeds the requirement or clearly abides by the constraint. Ratings are even more subjective than weights and should also be determined through open discussion among users, analysts, and managers. For each requirement and constraint, a score is calculated by multiplying the rating for each requirement and each constraint by its weight. The final step is to add up the weighted scores for each alternative. Notice that we have included three sets of totals: for requirements, for constraints, and overall totals. If you look at the totals for requirements, alternative B or C is the best choice, because both meet or exceed all requirements. However, if you look only at constraints, alternative A is the best choice, because it does not violate any constraints. When we combine the totals for requirements and constraints, we see that the best choice is alternative C. Whether alternative C is actually chosen for development, however, is another issue. The decision makers may choose alternative A, knowing that it does not meet two key requirements, because it has the lowest cost. In short, what may appear to be the best choice for a systems development project may not always be the one that ends up being developed. By conducting a thorough analysis, organizations can greatly improve their decision-making performance.

Figure 4-5
Information systems development projects come from both top-down and bottom-up initiatives
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. An organization reach its objectives. Due to the principle of incremental commitment, a selected project does not necessarily result in a working system. After each subsequent SDLC phase, you, other members of the project team, and organizational officials will reassess your project to 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.

Many organizations have found that in order to make good project selection decisions 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. In the next section, we provide a brief overview of the process many organizations follow, involving corporate strategic planning and information systems planning, when setting their business strategy and objectives and when defining the role of information systems in their plans.

CORPORATE AND INFORMATION SYSTEMS PLANNING

Although there are numerous motivations for carefully planning the identification and selection of projects (see Atkinson, 1990; Kelly, 2006; Luftman, 2004; Ross and Feeny, 2000), organizations have not traditionally used a 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.

In contrast, planning-based approaches essentially ask the question: “What information (or data) requirements will satisfy the decision-making needs or business processes of the enterprise today and well into the future?” A major advantage of this approach is that an organization’s informational needs are less likely to change (or will change more slowly) than its business processes. For example, unless an organization fundamentally changes its business, its underlying data structures may remain reasonably stable for more than 10 years. However, the procedures used to access and process the data may change many times during that period. Thus, the challenge of most organizations is to design comprehensive information models containing data that are relatively independent from the languages and programs used to access, create, and update them.

To benefit from a planning-based approach for identifying and selecting projects, an organization must analyze its information needs and plan its projects carefully. Without careful planning, organizations may construct databases and systems that support individual processes but do not provide a resource that can be easily shared throughout the organization. Further, as business processes change, lack of data and systems integration will hamper the speed at which the organization can effectively make business strategy or process changes.

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

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.

Careful planning and selection of projects alone will certainly not solve all of these problems. We believe, however, that a disciplined approach, driven by top management commitment, is a prerequisite for most effectively applying information systems in order to reach organizational objectives. The focus of this section is to provide you with a clear understanding of how specific development projects with a broader organizational focus can be identified and selected. Specifically, we describe corporate strategic planning and information systems planning, two processes that can significantly improve the quality of project identification and selection decisions. This section also outlines the types of information about business direction and general systems requirements that can influence selection decisions and guide the direction of approved projects.

**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. Figure 4-6 represents this as 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. The process of developing and refining models of the current and future enterprise as well as a transition strategy is often referred to as corporate strategic planning. 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.

**Corporate Strategic Planning**

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Mission statement: A statement that makes it clear what business a company is in.

Objective statements: A series of statements that express an organization’s qualitative and quantitative goals for reaching a desired future position.

All successful organizations have a mission. The mission statement of a company typically states in very simple terms what business the company is in. For example, the mission statement for Pine Valley Furniture is shown in Figure 4-7. After reviewing PVF’s mission statement, it becomes clear that it is in the business of constructing and selling high-quality wood furniture to the general public, businesses, and institutions such as universities and hospitals. It is also clear that PVF is not in the business of fabricating steel file cabinets or selling its products through wholesale distributors. Based on this mission statement, you could conclude that PVF does not need a retail sales information system; instead, a high-quality human resource information system would be consistent with its goal.

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 are either qualitative or quantitative but that typically do not contain details likely to change substantially over time. Objectives are often referred to as critical success factors. Here, we will simply use the term objectives. The objectives for PVF are shown in Figure 4-8, with most relating to some aspect of the organizational mission. For example, the second objective relates to how PVF views its relationships with customers. This goal would suggest that PVF...
might want to invest in a Web-based order tracking system that would contribute to high-quality customer service. Once a company has defined its mission and objectives, a competitive strategy can be formulated.

A competitive strategy is the method by which an organization attempts to achieve its mission and objectives. In essence, the strategy is an organization’s game plan for playing in the competitive business world. In his classic book on competitive strategy, Michael Porter (1980) defined three generic strategies—low-cost producer, product differentiation, and product focus or niche—for reaching corporate objectives (see Table 4-3). These generic strategies allow you to more easily compare two companies in the same industry that may not employ the same competitive strategy. In addition, organizations employing different competitive strategies often have different informational needs to aid decision making. For example, Rolls-Royce and Kia Motors are two car lines with different strategies: One is a high-prestige line in the ultra-luxury niche, whereas the other is a relatively low-priced line for the general automobile market. Rolls-Royce may build information systems to collect and analyze information on customer satisfaction to help manage a key company objective. Alternatively, Kia may build systems to track plant and material utilization in order to manage activities related to its low-cost strategy.

To effectively deploy resources such as the creation of a marketing and sales organization or to build the most effective information systems, an organization must clearly understand its mission, objectives, and strategy. A lack of understanding will make it impossible to know which activities are essential to achieving business objectives. From an information systems development perspective, by understanding which activities are most critical for achieving business objectives, an organization has a much greater chance to identify those activities that need to be supported by information systems. In other words, it is only through the clear understanding of the organizational mission, objectives, and strategies that IS development projects should be identified and selected. The process of planning how information systems can be employed to assist organizations to reach their objectives is the focus of the next section.

**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). Information systems planning is an orderly means of assessing the information needs of an organization and defining the information systems, databases, and technologies that would best satisfy those needs.

**TABLE 4-3 Generic Competitive Strategies**

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low-Cost Producer</td>
<td>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.</td>
</tr>
<tr>
<td>Product Differentiation</td>
<td>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 (for example, &quot;At Ford, quality is job one.&quot;).</td>
</tr>
<tr>
<td>Product Focus or Niche</td>
<td>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 while others may employ a differentiation strategy based on performance or style.</td>
</tr>
</tbody>
</table>

(Source: Adapted from Porter, 1980.)

**Competitive strategy:** The method by which an organization attempts to achieve its mission and objectives.

**Information systems planning (ISP):** An orderly means of assessing the information needs of an organization and defining the systems, databases, and technologies that will best satisfy those needs.
will best satisfy those needs (Carlson et al., 1989; Luftman, 2004; Parker and Benson, 1989; Segars and Grover, 1999). This means that during ISP you (or, more likely, senior IS managers responsible for the IS plan) must model current and future organization informational needs and develop strategies and project plans to migrate the current information systems and technologies to their desired future state. ISP is a top-down process that takes into account the outside forces—industry, economic, relative size, geographic region, and so on—that are critical to the success of the firm. This means that ISP must look at information systems and technologies in terms of how they help the business achieve its objectives defined during corporate strategic planning.

The three key activities of this modeling process are represented in Figure 4-9. 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 its 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. (Of course, scheduled projects from the ISP process are just one source for projects. Others include bottom-up requests from managers and business units, such as the SSR in Figure 3-2.)

For example, a project may focus on reconfiguration of a telecommunications network to speed data communications or it may restructure work and data flows between business areas. Projects can include not only the development of new information systems or the modification of existing ones, but also the acquisition and management of new systems, technologies, and platforms. These three activities parallel those of corporate strategic planning, and this relationship is shown in Figure 4-10. Numerous methodologies such as Business Systems Planning (BSP) and Information Engineering (IE) have been developed to support the ISP process (see Segars and Grover, 1999); most contain the following three key activities:

1. **Describe the current situation.** The most widely used approach for describing the current organizational situation is generically referred to as top-down planning. **Top-down planning** attempts to gain a broad understanding of the information systems needs of the entire organization.

---

**Figure 4-9**  
Information systems planning is a three-step process

---

**Top-down planning:** A generic information systems planning methodology that attempts to gain a broad understanding of the information systems needs of the entire organization.
mational needs of the entire organization. The approach begins by conducting an extensive analysis of the organization’s mission, objectives, and strategy and determining the information requirements needed to meet each objective. This approach to ISP implies by its name a high-level organizational perspective with active involvement of top-level management. The top-down approach to ISP has several advantages over other planning approaches, which are summarized in Table 4-4.

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 and also has the advantage of identifying pressing organizational problems. Yet, the

**Table 4-4 Advantages to the Top-Down Planning Approach Over Other Planning Approaches**

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broader Perspective</td>
<td>If not viewed from the top, information systems may be implemented without first understanding the business from general management’s viewpoint.</td>
</tr>
<tr>
<td>Improved Integration</td>
<td>If not viewed from the top, totally new management information systems may be implemented rather than planning how to evolve existing systems.</td>
</tr>
<tr>
<td>Improved Management Support</td>
<td>If not viewed from the top, planners may lack sufficient management acceptance of the role of information systems in helping them achieve business objectives.</td>
</tr>
<tr>
<td>Better Understanding</td>
<td>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.</td>
</tr>
</tbody>
</table>

(Source: IBM, 1982; pp. 236–37.)
bottom-up approach often fails to view the informational needs of the entire organization. This can result in the creation of disparate information systems and databases that are redundant or not easily integrated without substantial rework.

The process of describing the current situation begins by selecting a planning team that includes executives chartered to model the existing situation. To gain this understanding, the team will need to review corporate documents; interview managers, executives, and customers; and conduct detailed reviews of competitors, markets, products, and finances. The type of information that must be collected to represent the current situation includes the identification of all organizational locations, units, functions, processes, data (or data entities), and information systems.

Within Pine Valley Furniture, for example, organizational locations would consist of a list of all geographic areas in which the organization operates (e.g., the locations of the home and branch offices). Organizational units represent a list of people or business units that operate within the organization. Thus, organizational units would include vice president of manufacturing, sales manager, salesperson, and clerk. Functions are cross-organizational collections of activities used to perform day-to-day business operations. Examples of business functions might include research and development, employee development, purchasing, and sales. Processes represent a list of manual or automated procedures designed to support business functions. Examples of business processes might include payroll processing, customer billing, and product shipping. Data entities represent a list of the information items generated, updated, deleted, or used within business processes. Information systems represent automated and nonautomated systems used to transform data into information to support business processes. For example, Figure 4-11 shows portions of the business functions, data entities, and information systems of PVF. Once high-level information is collected, each item can typically be decomposed into smaller units as more detailed planning is performed. Figure 4-12 shows the decomposition of several of PVF’s high-level business functions into more detailed supporting functions.

After creating these lists, a series of matrices can be developed to cross-reference various elements of the organization. The types of matrices typically developed include the following:

- **Location-to-Function**: This matrix identifies which business functions are being performed at various organizational locations.
- **Location-to-Unit**: This matrix identifies which organizational units are located in or interact with a specific business location.
- **Unit-to-Function**: This matrix identifies the relationships between organizational entities and each business function.

**Figure 4-11**
Information systems planning information (Pine Valley Furniture)

<table>
<thead>
<tr>
<th>FUNCTIONS:</th>
<th>DATA ENTITIES:</th>
<th>INFORMATION SYSTEMS:</th>
</tr>
</thead>
<tbody>
<tr>
<td>business planning</td>
<td>customer</td>
<td>payroll processing</td>
</tr>
<tr>
<td>product development</td>
<td>product</td>
<td>accounts payable</td>
</tr>
<tr>
<td>marketing and sales</td>
<td>vendor</td>
<td>accounts receivable</td>
</tr>
<tr>
<td>production operations</td>
<td>raw material</td>
<td>time card processing</td>
</tr>
<tr>
<td>finance and accounting</td>
<td>order</td>
<td>inventory management</td>
</tr>
<tr>
<td>human resources</td>
<td>invoice</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>equipment</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>
Figure 4-12
Functional decomposition of information systems planning information (Pine Valley Furniture)

- Function-to-Objective: This matrix identifies which functions are essential or desirable in achieving each organizational objective.
- Function-to-Process: This matrix identifies which processes are used to support each business function.
- Function-to-Data Entity: This matrix identifies which business functions utilize which data entities.
- Process-to-Data Entity: This matrix identifies which data are captured, used, updated, or deleted within each process.
- Process-to-Information System: This matrix identifies which information systems are used to support each process.
- Data Entity-to-Information System: This matrix identifies which data are created, updated, accessed, or deleted in each system.
- Information System-to-Objective: This matrix identifies which information systems support each business objective as identified during organizational planning.

Different matrices will have different relationships depending on what is being represented. For example, Figure 4-13 shows a portion of the Data
Data Entity-to-Function matrix (Pine Valley Furniture)

Entity-to-Function matrix for Pine Valley Furniture. The “X” in various cells of the matrix represents which business functions utilize which data entities. A more detailed picture of data utilization would be shown in the Process-to-Data Entity matrix (not shown here), in which the cells would be coded as “C” for the associated process that creates or captures data for the associated data entity, “R” for retrieve (or used), “U” for update, and “D” for delete. This means that different matrices can have different relationships depending on what is being represented. Because of this flexibility and ease of representing information, analysts use a broad range of matrices to gain a clear understanding of an organization’s current situation and to plan for its future (Kerr, 1990). A primer on using matrices for information systems planning is provided in Figure 4-14.

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 information systems (see Figure 4-9). For example, if a desired future state of the organization is to have several new branch offices or a new product line that requires several new employee positions, functions, processes, and data, then most lists and matrices will need to be updated to reflect this vision. The target situation must be developed in light of technology and business trends, in addition to organizational constraints. This means that lists of business trends and constraints should also be constructed in order to help ensure that the target situation reflects these issues.

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.
During the information systems planning process, before individual projects are identified and selected, a great deal of “behind the scenes” analysis takes place. During this planning period, which can span from six months to a year, IS planning team members develop and analyze numerous matrices like those described in the associated text. Matrices are developed to represent the current and the future views of the organization. Matrices of the “current” situation are called “as is” matrices. In other words, they describe the world “as” it currently “is.” Matrices of the target or “future” situation are called “to be” matrices. Contrasting the current and future views provides insights into the relationships existing in important business information, and most importantly, forms the basis for the identification and selection of specific development projects. Many CASE tools provide features that will help you make sense out of these matrices in at least three ways:

1. **Management of Information.** A big part of working with complex matrices is managing the information. Using the dictionary features of the CASE tool repository, terms (such as business functions and process and data entities) can be defined or modified in a single location. All planners will therefore have the most recent information.

2. **Matrix Construction.** The reporting system within the CASE repository allows matrix reports to be easily produced. Since planning information can be changed at any time by many team members, an easy method to record changes and produce the most up-to-date reports is invaluable to the planning process.

3. **Matrix Analysis.** Possibly the most important feature CASE tools provide to planners is the ability to perform complex analyses within and across matrices. This analysis is often referred to as **affinity clustering.** Affinity refers to the extent to which information holds things in common. Thus, affinity clustering is the process of arranging matrix information so that clusters of information with some predetermined level or type of affinity are placed next to each other on a matrix report. For example, an affinity clustering of a Process-to-Data Entry matrix would create roughly a block diagonal matrix with processes that use similar data entities appearing in adjacent rows and data entities used in common by the same processes grouped into adjacent columns. This general form of analysis can be used by planners to identify items that often appear together (or should!). Such information can be used by planners to most effectively group and relate information (e.g., data to processes, functions to locations, and so on). For example, those data entities used by a common set of processes are candidates for a specific database. And those business processes that relate to a strategically important objective will likely receive more attention when managers from those areas request system changes.

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 doing, how, when, and by whom in the organization. The components of a typical information systems plan are outlined in Figure 4-15.

The IS plan is typically a very comprehensive document that looks at both short- and long-term organizational development needs. The short- and long-term developmental needs identified in the plan are typically expressed as a series of projects (see Figure 4-16). Projects from the long-term plan tend to build a foundation for later projects (such as transforming databases from old technology into newer technology). Projects from the short-term plan consist of specific steps to fill the gap between current and desired systems or respond to dynamic business conditions. The top-down (or plan-driven) projects join a set of bottom-up or needs-driven projects submitted as system service requests from managers to form the short-term systems development...
## 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 are we, 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 Information Systems
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.

### Figure 4-15
Outline of an information systems plan

Collectively, the short- and long-term projects set clear directions for the project selection process. The short-term plan includes not only those projects identified from the planning process but also those selected from among bottom-up requests. The overall IS plan may also influence all development projects. For example, the IS mission and IS constraints may cause projects to choose certain technologies or emphasize certain application features as systems are designed.

In this section, we outlined a general process for developing an IS plan. ISP is a detailed process and an integral part of deciding how to best deploy information systems and technologies to help reach organizational goals. It is beyond the scope of this chapter, however, to extensively discuss ISP, yet it should be clear from our discussion that planning-based project identification and selection will yield substantial benefits to an organization. It is probably also clear to you that, as a systems analyst, you are not usually involved in IS planning, because this process requires senior IS and corporate management participation. On the other hand, the results of IS planning, such as planning

### Figure 4-16
Systems development projects flow from the information systems plan

<table>
<thead>
<tr>
<th>Information Systems Plan:</th>
<th>Project 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Organizational Mission</td>
<td>2</td>
</tr>
<tr>
<td>II. Informational Inventory</td>
<td>3</td>
</tr>
<tr>
<td>III. Mission and Objectives of IS</td>
<td>4</td>
</tr>
<tr>
<td>IV. Constraints</td>
<td>5</td>
</tr>
<tr>
<td>V. Long-Term Plan</td>
<td>6</td>
</tr>
<tr>
<td>VI. Short-Term Plan</td>
<td>7</td>
</tr>
<tr>
<td>VII. Conclusions</td>
<td>8</td>
</tr>
</tbody>
</table>
matrices like that in Figure 4-13, can be a source of very valuable information as you identify and justify projects.

**ELECTRONIC COMMERCE APPLICATIONS: IDENTIFYING AND SELECTING SYSTEMS DEVELOPMENT PROJECTS**

Identifying and selecting systems development projects for an Internet-based electronic commerce application is no different from the process followed for more traditional applications. Nonetheless, there are some special considerations when developing an Internet-based application. In this section, we highlight some of those issues that relate directly to the process of identifying and selecting Internet-related systems development projects.

**Internet Basics**

The name Internet is derived from the concept of “internetworking,” that is, connecting host computers and their networks to form an even larger, global network. And that is essentially what the Internet is—a large, worldwide network of networks that use a common protocol to communicate with each other. The interconnected networks include Windows, UNIX, IBM, Novell, Apple, Linux, and many other network and computer types. The Internet stands as the most prominent representation of global networking. Using the Internet to support day-to-day business activities is broadly referred to as **electronic commerce (EC)**. However, not all Internet EC applications are the same. For example, there are three general classes of Internet EC applications: Internet, intranet, and extranet. Figure 4-17 shows three possible modes of EC using the Internet. The term used to describe transactions between individuals and businesses is Internet-based EC. So, the term **Internet** is used to refer to both the global computing network and to business-to-consumer (B2C) EC applications. **Intranet** refers to the use of the Internet within the same business, and **extranet** refers to the use of the Internet between firms. Extranet EC is commonly referred to as “B2B” because it is business-to-business EC.

Intranets and extranets are examples of two ways organizations have been communicating via technology for years. For example, intranets are a lot like having a “global” local area network (LAN). Organizations with intranets dictate what applications will run over the intranet—such as e-mail or an inventory-control system—as well as dictate the speed and quality of the hardware connected to the intranet. In other words, intranets are a new twist—a global twist—to an old way of using information systems to support business activities within a single organization. Likewise, extranets are also similar to an established computing model, **electronic data interchange (EDI)**. EDI refers to the use of telecommunications technologies to directly transfer business documents between organizations. Using EDI, trading partners (suppliers, manufacturers, customers, etc.) establish computer-to-computer links

**Electronic commerce (EC):** Internet-based communication to support day-to-day business activities.

**Internet:** A large, worldwide network of networks that use a common protocol to communicate with each other.

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

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

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

---

**Figure 4-17**

Three possible modes of electronic commerce
TABLE 4-5 Unknowns That Must Be Dealt with When Designing and Building Internet Applications

| User | • Concern: Who is the user?  
|      | • Example: Where is the user located? What is the user’s expertise, education, or expectations? |
| Connection Speed | • Concern: What is the speed of the connection and what information can be effectively displayed?  
|      | • Example: Modem, Cable Modem, DSL, Satellite, Broadband, Cellular |
| Access Method | • Concern: What is the method of accessing the net?  
|      | • Example: Web browser, Personal Digital Assistant (PDA), Web-enabled Cellular Phone, Web-enabled Television |

that allow them to exchange data electronically. For example, a company using EDI may send an electronic purchase order instead of a paper request to a supplier. The paper order may take several days to arrive at the supplier, whereas an EDI purchase order will only take a few seconds. EDI is fast becoming the standard by which organizations will communicate with each other in the world of electronic commerce.

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 supported (e.g., Web browsers such as Internet Explorer, mobile devices such as a Palm Pilot, or Web-enabled cellular phone such as the Motorola Q). On the other hand, when developing an Internet EC application (hereafter, simply EC), there are countless unknowns that developers have to discern in order to build a useful system. Table 4-5 lists a sample of the numerous unknowns to be dealt with when designing and building an EC application. 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, there is no shortage of Internet EC applications 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 board of directors of PVF has requested that a project team be created to explore the opportunity to develop an EC system. Specifically, market research has found that there is a good opportunity for online furniture purchases, especially in the areas of:

• Corporate furniture  
• Home office furniture  
• Student furniture

The board wants to incorporate all three target markets into its long-term EC plan, but wants to initially focus on the corporate furniture buying system. Board members feel 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. Throughout the remainder of the book, we will follow the evolution of the WebStore project until it becomes operational for PVF.
Summary

In this chapter, we described the first major activity of the planning phase of the SDLC—project identification and selection. 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.

The quality of the project identification and selection process can be improved if decisions are guided by corporate strategic planning and information systems planning. Corporate strategic planning is the process of identifying the mission, objectives, and strategies of an organization. Crucial in this process is selecting a competitive strategy that states how the organization plans to achieve its objectives.

Information systems planning is an orderly means for assessing the information needs of an organization and defining the systems and databases that will best satisfy those needs. ISP is a top-down process that takes into account outside forces that drive the business and the factors critical to the success of the firm. ISP evaluates the current inventory of systems and the desired future state of the organization and its system, and determines which projects are needed to transform systems to meet the future needs of the organization.

Corporate and IS planning are highly interrelated. Conceptually, these relationships can be viewed via various matrices that show how organizational objectives, locations, units, functions, processes, data entities, and systems relate to one another. Selected projects will be those viewed to be most important in supporting the organizational strategy.

The Internet is a global network consisting of thousands of interconnected individual networks that communicate with each other using a common protocol. Electronic commerce (EC) refers to the use of the Internet to support day-to-day business activities. Internet-based EC refers to transactions between individuals and businesses. Intranet refers to the use of the Internet within the same organization. Extranet refers to the use of the Internet between firms.

The focus of this chapter was to provide you with a clearer understanding of how organizations identify and select projects. Improved project identification and selection is needed for the following reasons: The cost of information systems is rising rapidly, systems cannot handle applications that cross organizational boundaries, systems often do not address critical organizational objectives, data redundancy is often out of control, and system maintenance costs continue to rise. Thus, effective project identification and selection is essential if organizations are to realize the greatest benefits from information systems.

Key Terms

1. Affinity clustering
2. Bottom-up planning
3. Competitive strategy
4. Corporate strategic planning
5. Electronic commerce (EC)
6. Electronic data interchange (EDI)
7. Extranet
8. Incremental commitment
9. Information systems planning (ISP)
10. Internet
11. Intranet
12. Mission statement
13. Objective statements
14. Top-down planning
15. Value chain analysis

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

- Analyzing an organization’s activities to determine where value is added to products and/or services and the costs incurred for doing so.
- A strategy in systems analysis and design in which the project is reviewed after each phase and continuation of the project is rejustified.
- An ongoing process that defines the mission, objectives, and strategies of an organization.
- A statement that makes it clear what business a company is in.
- A series of statements that express an organization’s qualitative and quantitative goals for reaching a desired future position.
- The method by which an organization attempts to achieve its mission and objectives.
- An orderly means of assessing the information needs of an organization and defining the systems, databases, and technologies that will best satisfy those needs.
A generic information systems planning methodology that attempts to gain a broad understanding of the information system needs of the entire organization.

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.

The process of arranging planning matrix information so the clusters of information with some predetermined level or type of affinity are placed next to each other on a matrix report.

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Review Questions

1. Contrast the following terms:
   - Mission; objective statements; competitive strategy
   - Corporate strategic planning; information systems planning
   - Top-down planning; bottom-up planning
   - Low-cost producer; product differentiation; product focus or niche
   - Data entity; information system

2. Describe the project identification and selection process.
3. Describe several project evaluation criteria.
4. Describe value chain analysis and how organizations use this technique to evaluate and compare projects.

5. Discuss several factors that provide evidence for the need for improved information systems planning today.
6. Describe the steps involved in corporate strategic planning.
7. What are three generic competitive strategies?
8. Describe what is meant by information systems planning and the steps involved in the process.
9. List and describe the advantages of top-down planning over other planning approaches.
10. Briefly describe nine planning matrices that are used in information systems planning and project identification and selection.
11. Discuss some of the factors that must be considered when designing and building Internet applications.

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Problems and Exercises

1. 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.
2. When you are happy with the mission statement you have developed in response to the prior question, describe the objectives and competitive strategy for achieving that mission.
3. Consider an organization that you believe does not conduct adequate strategic IS planning. List at least six reasons why this type of planning is not done appropriately (or is not done at all). Are these reasons justifiable? What are the implications of this inadequate strategic IS planning? What limits, problems, weaknesses, and barriers might this present?
4. IS planning, as depicted in this chapter, is highly related to corporate strategic planning. What might those responsible for IS planning have to do if they operate in an organization without a formal corporate planning process?
5. The economic analysis carried out during the project identification and selection phase of the systems development life cycle is rather cursory. 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?
6. In those organizations that do an excellent job of IS planning, why might projects identified from a bottom-up process still find their way into the project initiation and planning phase of the life cycle?
7. Figure 4-14 introduces the concept of affinity clustering. Suppose that through affinity clustering it was found that three business functions provided the bulk of the use of five data entities. What implications might this have for project identification and subsequent steps in the systems development life cycle?
8. Timberline Technology manufactures membrane circuits in its Northern California plant. In addition, all circuit design and R&D work occur at this site. All finance, accounting, and human resource functions are headquartered at the parent company in the upper Midwest. Sales take place through six sales representatives located in various cities across the country. Information systems for payroll processing, accounts payable, and accounts receivable are located at the parent office while systems for inventory management and computer-integrated manufacturing are at the California plant. As best you can, list the locations, units, functions, processes, data entities, and information systems for this company.
9. For each of the following categories, create the most plausible planning matrices for Timberline Technology, described in Problem and Exercise 8: function-to-data entity, process-to-data entity, process-to-information system, data entity-to-information system. What other information systems not listed is Timberline likely to need?

10. The owners of Timberline Technology (described in Problem and Exercise 8) are considering adding a plant in Idaho and one in Arizona and six more sales representatives at various sites across the country. Update the matrices from Problem and Exercise 9 so that the matrices account for these changes.

Field Exercises

1. Obtain a copy of an organization’s mission statement. (One can typically be found in an organization’s annual report. Such reports are often available in university libraries or in corporate marketing brochures. If you are finding it difficult to locate this material, write or call the organization directly and ask for a copy of the mission statement.) What is this organization’s area of business? What does the organization value highly (e.g., high-quality products and services, low cost to consumers, employee growth and development, etc.)? If the mission statement is well written, these concepts should be clear. Do you know anything about the information systems in this company that would demonstrate that the types of systems in place reflect the organization’s mission? Explain.

2. Interview the managers of the information systems department of an organization to determine the level and nature of their strategic information systems planning. Does it appear to be adequate? Why or why not? Obtain a copy of that organization’s mission statement. To what degree do the strategic IS plan and the organizational strategic plan fit together? What are the areas where the two plans fit and do not fit? If there is not a good fit, what are the implications for the success of the organization? For the usefulness of their information systems?

3. Choose an organization that you have contact with, perhaps your employer or university. Follow the “Outline of an information systems plan” shown in Figure 4-16 and complete a short information systems plan for the organization you chose. Write at least a brief paragraph for each of the seven categories in the outline. If IS personnel and managers are available, interview them to obtain information you need. Present your mock plan to the organization’s IS manager and ask for feedback on whether or not your plan fits the IS reality for that organization.

4. Choose an organization that you have contact with, perhaps your employer or university. List significant examples for each of the items used to create planning matrices. Next, list possible relationships among various items and display these relationships in a series of planning matrices.

5. Write separate mission statements that you believe would describe Microsoft, IBM, and AT&T. Compare your mission statements with the real mission statements of these companies. Their mission statements can typically be found in their annual reports. Were your mission statements comparable to the real mission statements? Why or why not? What differences and similarities are there among these three mission statements? What information systems are necessary to help these companies deliver on their mission statements?

6. Choose an organization that you have contact with, perhaps your employer or university. Determine how information systems projects are identified. Are projects identified or not your plan fits the IS reality for that organization. Are they identified as part of the information systems planning or the corporate strategic planning process? Why or why not?

References


CASE INTRODUCTION

Carrie Douglass graduated from Stillwater State University with a Bachelors of Arts degree in Marketing. Among the courses Carrie took at Stillwater were several on information technology in marketing, including one on electronic commerce. While at Stillwater, Carrie worked part-time as an assistant manager at the Broadway Entertainment Company (BEC) store in Centerville, Ohio, a suburb of Dayton. After graduation, Carrie was recruited by BEC for a full-time position because of her excellent job experience at BEC and her outstanding record in classes and student organizations at Stillwater. Carrie immediately entered the BEC Manager Development Program, which consisted of three months of training, observation of experienced managers at several stores, and work experience.

The first week of training was held at the BEC regional headquarters in Columbus, Ohio. Carrie learned about company procedures and policies, trends in the home entertainment industry, and personnel practices used in BEC stores. It was during this week that Carrie was introduced to the BEC Blueprint for the Decade, a vision statement for the firm, shown in BEC Figure 4-1.

The Blueprint, as it is called, seemed rather abstract to Carrie while in training. Carrie saw a video in which Nigel Broad, BEC’s chairman, explained the importance of the Blueprint. Nigel was very sincere and clearly passionate about BEC’s future hinging on every employee finding innovative ways for BEC to achieve the vision outlined in the Blueprint.

After the three-month development program was over, Carrie was surprised to be appointed manager of the Centerville store. The previous manager was promoted to a marketing position in Columbus, which created this opportunity. Carrie started her job with enthusiasm, wanting to apply what she had learned at Stillwater and in the Management Development Program.

THE IDEA FOR A NEW SYSTEM

Although confident in her skills, Carrie believes that learning never stops. So, she logged onto the Amazon.com Web site one night from her home computer to look for some books on trends in retail marketing. While on the Web site, Carrie saw that Amazon.com was selling some of the same products BEC sells and rents in its stores. She had visited the BEC Web site often. Although a rich source of information about the company (she had found her first job with BEC from a job posting on the company’s Web site), BEC was not engaged in electronic commerce with customers.

All of a sudden, the words of the BEC Blueprint for the Decade started to come to life for Carrie. The Blueprint said that “BEC will be a leader in all areas of our business—human resources, technology, operations, and marketing.” And, “BEC will be innovative in the use of technology . . . to provide better service to our customers.” These statements caused Carrie to recall a conversation she had had in the store just that day with a mother of several young children.

The mother, a frequent BEC customer, had complimented Carrie on the cleanliness of the store and efficiency of checkout. The mother added, however, that she wished BEC better understood all her needs. For example, she enjoys watching movies, but she is finding it harder and harder to make the usual trips to the store to rent movies, given her very busy schedule with the children. It would be great if BEC started an online rental subscription service. This way, existing BEC customers could benefit from the convenience and flexibility of this new service. Carrie wondered why this kind of service was not being offered by BEC.

One of the books Carrie found on Amazon.com discussed customer relationship marketing. This seemed like exactly what the mother wanted from BEC. The mother didn’t want just products and services; rather, she wanted an online service that better supported all of her needs for home entertainment. She wanted BEC to relate to her, not just sell and rent products to her in a way that was not at all convenient for her.

During Carrie’s training program, Karen Gardner, the VP of Information Systems, talked about the different information systems that were being used at BEC. She
had also mentioned that the next step for BEC is to launch an online rental subscription service. Carrie had the opportunity to talk to Karen during one of the training sessions, and had informed Karen of the courses she had taken on information technology in marketing and electronic commerce. Karen was very impressed with Carrie’s educational background and had stated that her know-how would prove to be significant in improving BEC’s Web site to meet the needs of customers. Carrie was very excited because she had an idea of what needed to be done to improve the Web site to better suit the needs of the consumers.

As a new store manager, Carrie was quite busy, but she was anxious to do something about her idea. She still did not understand how all aspects of BEC worked (e.g., the Manager Development Program had not discussed how to work with BEC’s IS organization). Carrie thought that maybe she should call someone in the IS organization in Spartanburg to discuss her idea. The person who came to her mind was Karen Gardner. However, calling a vice president didn’t seem like the right call to make, because her idea did not relate directly to Entertainment Tracker. Carrie knew a way, however, to better develop her idea while still giving all the attention she needed to her new job. All she needed to do was to make one phone call, and she thought her idea could take shape.

**FORMALIZING A PROJECT PROPOSAL**

Carrie’s call was to Professor Martha Tann, head of the Management Information Systems (MIS) program at Stillwater State University. Carrie had taken Professor Tann’s course on MIS that was required of all business students at Stillwater. Professor Tann also supervises a two-semester capstone course for MIS majors in which student teams work in local organizations to do systems analysis, design, and development for a new or replacement information system. Carrie’s idea was to have an MIS student team develop a prototype of the system and use this prototype to sell the concept of the system to BEC management.

Over the next few weeks, Carrie and Professor Tann discussed Carrie’s idea and how projects are conducted...
by MIS students. Students in the course indicate which projects they want to work on among a set of projects submitted for the course by local organizations. There are always more requests submitted by local organizations than can be handled by the course, just like most organizations have more demand for information systems than can be satisfied by the available resources. Projects are presented to the students via a System Service Request form, typical of what would be used inside an organization for a user to request the IS group to undertake a systems development project. Once a group of students selects a project, the student team proceeds as if it were a group of systems analysts employed by the sponsoring organization or an outside consulting firm. Within any limitations imposed by the sponsoring organization, the students may conduct the project using any methodology or techniques appropriate for the situation.

The initial System Service Request that Carrie submitted for review by Professor Tann appears in BEC Figure 4-2. This request appears in a standard format used for all project submissions for the MIS project.

BEC Figure 4-2
System Service Request from Carrie Douglass

PROBLEM STATEMENT

Today, Broadway Entertainment Company (BEC) sells and rents videos, music, and games to customers. BEC is profitable and growing. Increased competition from existing and emerging competitors requires BEC to constantly consider better ways to meet the needs of its customers. Increasingly, customers want the convenience of an online rental service. Customers want us to be aware of their needs, and want us to create a new service that will help them better manage their time and entertainment needs. The vision of BEC is to be a market leader in the use of technology to provide the highest-quality customer service with the broadest range of products and services. Even though providing such an online rental service as part of our relationship with our customers is consistent with this vision, no such service is provided today. The purpose of the proposed project is to prove (or disprove) that such a service will improve customer satisfaction and lead to increased revenue and potentially increased market share. A sustainable competitive advantage would be desirable, but is not necessary at this stage.

Specifically, the proposed system will provide services such as (1) the ability for the customers to review a comprehensive library of titles, (2) specify their preferences in a wish list, (3) check on the status of delivery, (4) make a rental without a due date or late fees, (5) read movie recommendations from other customers, and (6) promotion of in-store special offers. The project should conduct a thorough analysis of online rental services, design a Web-based system to provide such a service, and implement and test a prototype of this system.

SERVICE REQUEST

I request that a thorough analysis of this idea be conducted. I need a working prototype of the system that could be tested with a selected group of actual customers. The prototype should include major system functions. A survey of users should be conducted to gather evidence to support (or possibly not support) my subsequent request to BEC to build such a system for all stores.

IS LIAISON

Student team leader, assigned when a team is selected for this project

SPONSOR

Carrie Douglass, Manager BEC Store OH-84

--- TO BE COMPLETED BY SYSTEMS PRIORITY BOARD ---

[ ] Request approved

Assigned to

[ ] Recommend revision

Start date

[ ] Suggest user development

[ ] Reject for reason
course at Stillwater State University. Professor Tann reviews initial requests for understandability by the students and gives submitters guidance on how to make the project more appealing to students.

When selecting among final System Service Requests, the students look for the projects that will give them the best opportunity to learn and integrate the skills needed to manage and conduct a systems analysis and design project. Professor Tann also asks the students to pretend to be a steering committee (sometimes called a Systems Priority Board) to select projects that appear to be well justified and of value to the sponsoring organization. So, Carrie knew that she would have to make the case for the project succinctly and persuasively, even before a preliminary study of the situation could be conducted. Her project idea would have to compete with other submissions, just as it would when she proposed it later within BEC. At least by then, she would have the experience from the prototype to prove the value of her ideas—if the students at Stillwater accepted her request.

Carrie and Professor Tann discussed how she might make a more persuasive argument for Carrie’s project idea. Professor Tann suggested that students would have many reasons to be motivated to work on submitted projects, including convenience, opportunity to work with interesting technologies, doability, and a sense that their work might make a difference for the organization. Carrie’s project seemed to satisfy the first three reasons, but Professor Tann asked Carrie to think more about the last reason. Obviously, the more likely the system the students might develop would be accepted by the BEC MIS group for final development, the more positive the students would feel that their work would make a difference. Professor Tann suggested that Carrie investigate what the BEC IS priorities were, and try to link her project idea to those priorities.

Carrie called the former manager of the Centerville store, Steve Tettau, to see if he, in his new position in the regional office, had an idea about the corporate IS priorities. Carrie got lucky. Steve had just been assigned to a team of IS staff and business managers who were charged with conducting a thorough review of Entertainment Tracker. The leader of this project had asked the team to analyze how well Entertainment Tracker aligned with the IS plan for BEC. Specifically, how did Entertainment Tracker relate to the objectives for BEC found in the Blueprint for the Decade and to specific IS strategic objectives. These objectives include the following:

- Better align IS development with corporate objectives
- Deliver global system solutions
- Reduce systems development backlog
- Increase skill level of IS staff

The team leader had told Steve that the BEC Systems Priority Board, which decided which IS projects were funded, would need to see a high-level analysis of how their project, and all other projects competing for limited corporate support, related to corporate and IS strategic plans.

With this new information, Carrie prepared a chart to relate her idea for a customer relationship management system to business and IS objectives; this chart appears in BEC Figure 4-3. Although this was very high-level

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**BEC Figure 4-3**

Web-based customer relationship management system alignment with IS plan

<table>
<thead>
<tr>
<th>Blueprint Objectives</th>
<th>Rating</th>
<th>Brief Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Increase market share and profitability</td>
<td>High</td>
<td>Loyalty through system increases market share and retains customers, increasing profitability</td>
</tr>
<tr>
<td>2. Leader in all areas of business</td>
<td>Moderate</td>
<td>System improves marketing</td>
</tr>
<tr>
<td>3. Cost-effective use of resources</td>
<td>Low</td>
<td>Saves some time of store employees</td>
</tr>
<tr>
<td>4. Industry leader in profitability and growth</td>
<td>High</td>
<td>See 1</td>
</tr>
<tr>
<td>5. Innovative use of technology</td>
<td>High</td>
<td>We have a chance to leapfrog our competition</td>
</tr>
<tr>
<td>6. Value diversity</td>
<td>High</td>
<td>Every customer’s input will be recorded</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IS Plan Objectives</th>
<th>Rating</th>
<th>Brief Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Better align IS development with corporate objectives</td>
<td>High</td>
<td>This project scores well on all six objectives above</td>
</tr>
<tr>
<td>2. Deliver global system solutions</td>
<td>High</td>
<td>Web system can easily be deployed globally, with multiple language sites</td>
</tr>
<tr>
<td>3. Reduce systems development backlog</td>
<td>None</td>
<td>No apparent impact</td>
</tr>
<tr>
<td>4. Increase skill level of IS staff</td>
<td>Moderate</td>
<td>This is a leading-edge application, requiring leading-edge skills</td>
</tr>
</tbody>
</table>

**Impact on Current Systems**

<table>
<thead>
<tr>
<th></th>
<th>Rating</th>
<th>Brief Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Some interaction with Entertainment Tracker to share or exchange data, but proposed system does not change architecture of existing systems</td>
</tr>
</tbody>
</table>
information, this information nonetheless might help the Stillwater students see the potential scope of the new system and the potential areas where the system might have impact.

**CASE SUMMARY**

Ideas for new or improved information systems come from a variety of sources, including the need to fix a broken system, the need to improve the performance of an existing system, competitive pressures or new/changed government regulations, requirements generated from top-down organizational initiatives, and creative ideas by individual managers. The request for a Web-based customer information system submitted by Carrie Douglass is an example of this common, last category. Often an organization is overwhelmed by such requests. An organization must determine which ideas are the most worthy, and what action should be taken in response to each request.

Carrie’s proposal creates an opportunity for students at Stillwater State University to engage in an actual systems development project. Although Carrie is not expecting a final, professional, and complete system, a working prototype that will be used by actual customers can serve as an example of the type of system that could be built by Broadway Entertainment. The project, as proposed, requests that all the typical steps in the analysis and design of an information system be conducted. Carrie Douglass could be rewarded for her creativity if the system proves to be worthwhile, or her idea could flop. The success of her idea depends on the quality of the work done by the students at Stillwater.

**CASE QUESTIONS**

1. The System Service Request (SSR) submitted by Carrie Douglass (BEC Figure 4-2) has not been reviewed by Professor Tann. If you were Professor Tann, would you ask for any changes to the request as submitted? If so, what changes would you request and why? If no changes, why? Remember, an SSR is a call for a preliminary study, not a thorough problem statement.

2. If you were a student in Professor Tann’s class, would you want to work on this project? Why or why not?

3. If you were a member of BEC’s steering committee, the Systems Priority Board, what action would you recommend for this project request if you had received it? Justify your answer.

4. Should Carrie have contacted Karen Gardner? Should Carrie have accepted only Steve Tettau’s suggestions, or should she have talked to others at this point? Justify your answer.

5. One of the ideas presented in this chapter is to relate system requests with the competitive strategy of the organization. What is BEC’s competitive strategy (address at least the items in Table 4-3), and how would you position Carrie’s project request with respect to this competitive strategy?

6. If you were a systems analyst in the BEC corporate IS department and you had received a call from Carrie Douglass about her project idea, what would you recommend to Carrie? What do you think Carrie would need to prepare or do, in addition to what she has already prepared, to submit a request to the System Priority Board?

7. Do you question any of the ratings and explanations in BEC Figure 4-3 (think like a member of the System Priority Board who might see this table)? Explain. Based on your reading of the introduction to the BEC case in Chapter 3, do you suggest adding into this table any other high-level summary information about the proposed system? Consider what other information could further relate the proposed system to corporate and IS strategy or help to motivate the potential worth of the proposed system (review ideas presented in this chapter about how projects are selected to generate possible responses to this question).

8. If you were an account representative with a small consulting firm that had received a request for proposal from Carrie Douglass to conduct the project she outlines, what would your response be? Is the System Service Request and project alignment document sufficient as a request for proposal? If so, why? If not, what is missing?