Unit-2 Planning

Identifying and Selecting Systems Development Projects

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

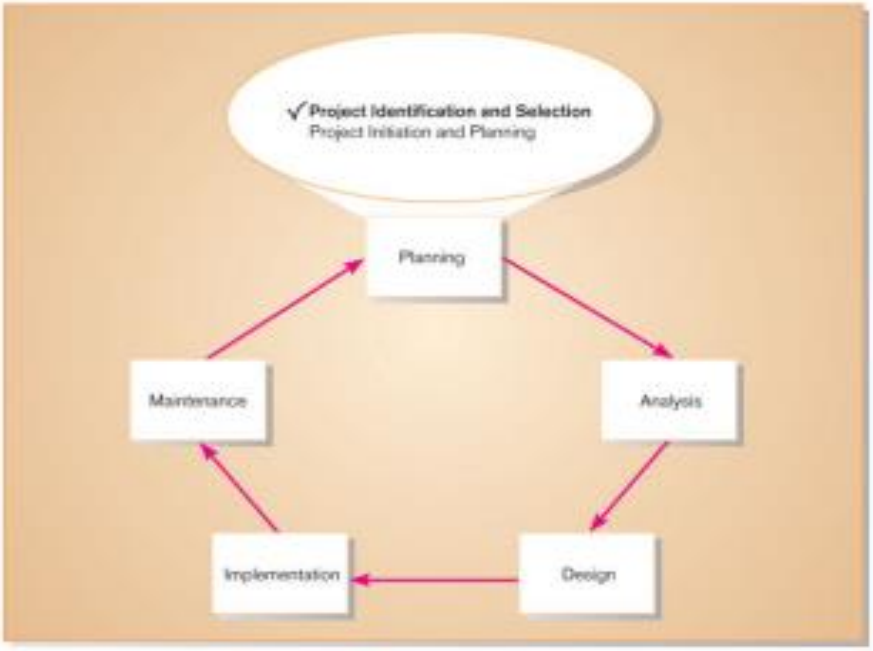


Figure: SDLC with project identification and selection highlighted

The first phase of the SDLC is planning, consisting of project identification and selection, and project initiation and planning as illustrated in above figure. During project identification and selection, a senior manager, a business group, as IS manager or a steering committee identifies and assesses all the 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.

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 projects.
3. Selecting projects for development.

Identifying potential development projects

Organizations vary as to how they identify projects. This process can be performed by:

- A key member of top management, either the CEO of a small or medium-size organization or a senior executive in a larger organization
- A steering committee, composed of a cross section of managers with an interest in systems
- User departments, in which either the head of the requesting unit or a committee from the requesting department decides which projects to submit (as a systems analyst, you will help users prepare such requests)
- The development group or a senior IS manager.

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

complexity, and risk, also influence the people who identify a project. Table below summarizes the characteristics of each selection method.

Table: Common Characteristics of Alternative Methods for Making Information Systems Identification and Selection Decisions

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

Classifying and ranking projects

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

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

Table: Possible Evaluation Criteria When Classifying and Ranking Projects

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

Selecting projects for development

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

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

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

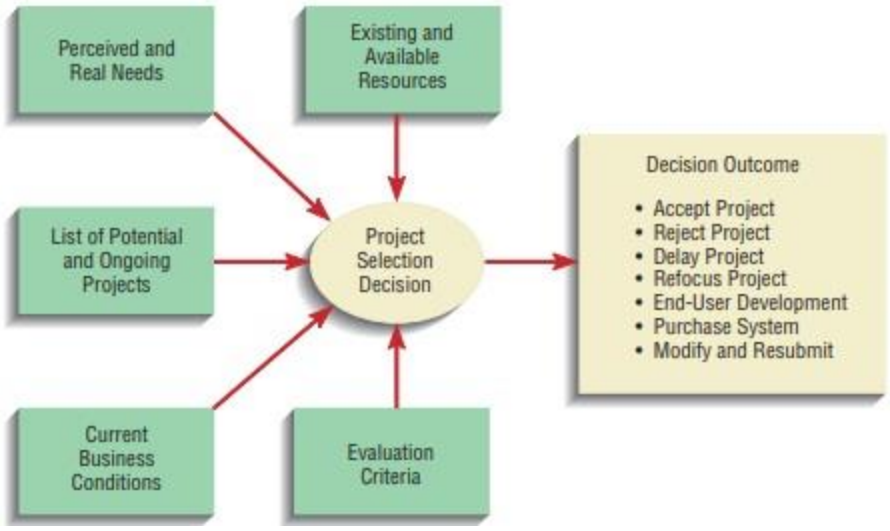


Figure: Numerous factors must be considered when selecting a project. Decisions can result in one of seven outcomes

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

Deliverables and Outcomes

The primary deliverable, or end product, from the project identification and selection phase is a schedule of specific IS development projects. These projects come from both top-down and bottom-up sources, and once selected they move into the second activity within this SDLC phase project initiation and planning. This sequence of events is illustrated in Figure below. An outcome of this activity is the assurance that people in the organization gave careful consideration to project selection and clearly understood how each project could help the organization reach its objectives. Because of the principle of incremental commitment, a selected project does not necessarily result in a working system. **Incremental commitment** means that after each subsequent SDLC activity, you, other members of the

project team, and organization officials will reassess your project. This reassessment will determine whether the business conditions have changed or whether a more detailed understanding of a system's costs, benefits, and risks would suggest that the project is not as worthy as previously thought.

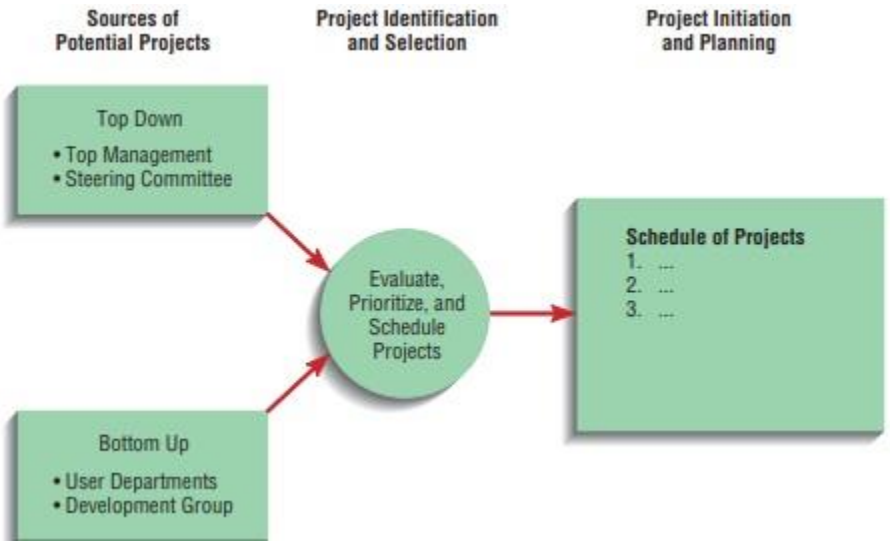


Figure: Information systems development projects come from both top-down and bottom-up initiatives.

Initiating and Planning Systems Development Projects

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

Most organizations assign an experienced systems analyst, or team of analysts for large projects, to perform project initiation and planning. The analyst will work with the proposed customers managers and users in a business unit of the system and other technical development staff in preparing the final plan. Experienced analysts working with customers who well understand their information services needs should be able to perform a detailed analysis with relatively little effort. Less experienced analysts with customers who only vaguely understand their needs will likely expend more effort in order to be certain that the project scope and work plan are feasible. **The objective of project initiation and planning is to transform a vague system request document into a tangible project description**, as illustrated in Figure below. Effective communication among the systems analysts, users, and management is crucial to the creation of a meaningful project plan. Getting all parties to agree on the direction of a project may be difficult for cross-department projects when different parties have different business objectives. Projects at large, complex organizations require systems analysts to take more time to analyze both the current and proposed systems.

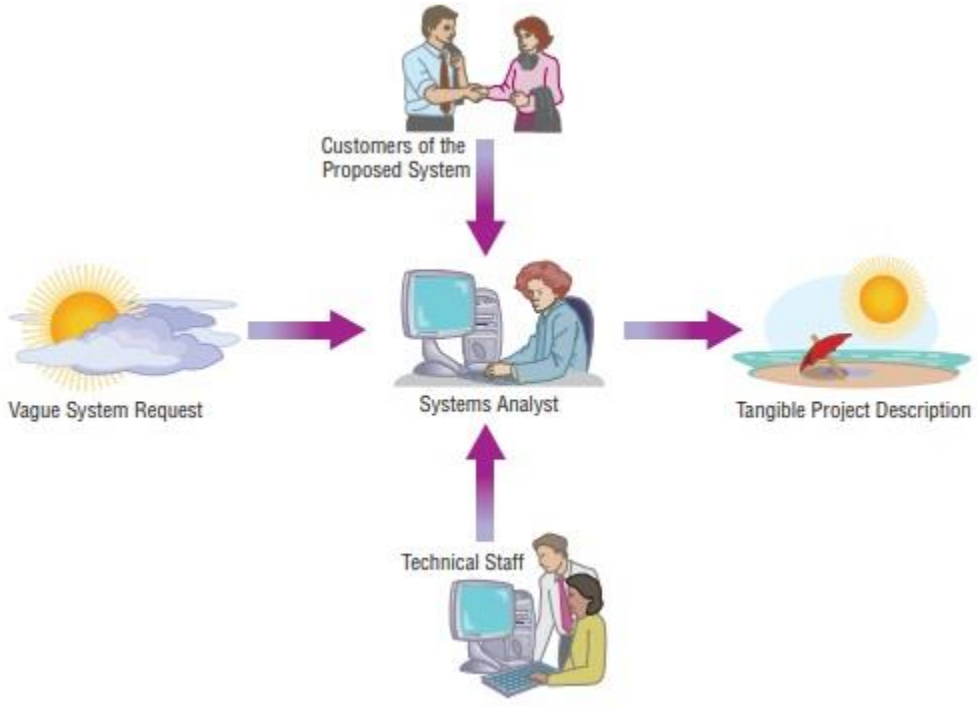


Figure: The systems analyst transforms a vague systems request into a tangible project description during project initiation and planning.

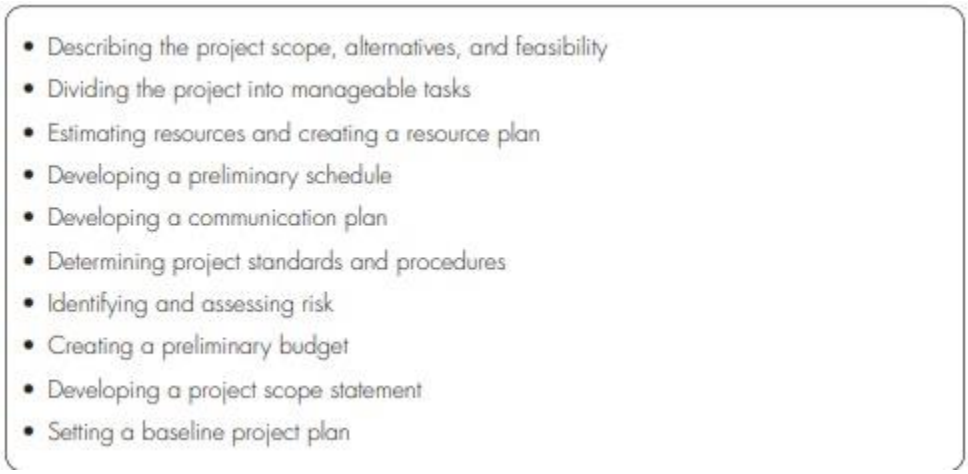
Process of Initiating and Planning IS Development Projects

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

Table: Types of Activities Performed during Project Initiation

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

Table: Activities Performed during Project Planning



Deliverables and Outcomes

The major outcomes and deliverables from project initiation and planning are the baseline project plan and the project scope statement. The **baseline project plan (BPP)** contains all information collected and analyzed during the project initiation and planning activity. The plan contains the best estimate of the project's scope, benefits, costs, risks, and resource requirements given the current understanding of the project. The BPP specifies detailed project activities for the next life cycle phase i.e. systems analysis and provides less detail for subsequent project phases (because these depend on the results of the analysis phase). Similarly, benefits, costs, risks, and resource requirements will become more specific and quantifiable as the project progresses. The project selection committee uses the BPP to help decide whether to continue, redirect, or cancel a project. If selected, the BPP becomes the foundation document for all subsequent SDLC activities; however, it is updated as new information is learned during subsequent SDLC activities.

The project scope statement (PSS) produced by the project team, clearly outlines the objectives of the project for the customer. As with the project initiation process, the size, scope, and complexity of a project dictate the comprehensiveness of the project planning process and the resulting documents.

Assessing Project Feasibility

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

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

Assessing Economic Feasibility

A study of economic feasibility is required for the baseline project plan. The purpose for **assessing economic feasibility** is to identify the financial benefits and costs associated with the development project. Economic feasibility is often referred to as **cost-benefit analysis**. During project initiation and planning, it will be impossible for you to define precisely all benefits and costs related to a particular project. Yet, it is important that you identify and quantify benefits and costs, or it will be impossible for you to conduct a sound economic analysis and determine whether one project is more feasible than another.

Determining Project Benefits

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

- Cost reduction and avoidance
- Error reduction

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

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

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

Determining Project Costs An information system can have both tangible and intangible costs. A **tangible cost** refers to an item that you can easily measure in dollars and with certainty. From a systems development perspective, tangible costs include items such as hardware costs, labor costs, and operational costs from employee training and building renovations. Alternatively, an intangible cost refers to an item that you cannot easily measure in terms of dollars or with certainty. **Intangible costs** can include loss of customer goodwill, employee morale, or operational inefficiency. Besides tangible and intangible costs, you can distinguish system-related development costs as either one-time or recurring. A **one-time cost** refers to a cost associated with project initiation and development and the start-up of the system. These costs typically encompass the following activities:

- System development
- New hardware and software purchases
- User training

- Site preparation
- Data or system conversion

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

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

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

The Time Value of Money Most techniques used to determine economic feasibility encompass the concept of the **time value of money (TVM).** TVM refers to comparing present cash outlays to future expected returns. As we've seen, the development of an information system has both one-time and recurring costs. Furthermore, benefits from systems development will likely occur sometime in the future. Because many projects may be competing for the same investment dollars and may have different useful life expectancies, all costs and benefits must be viewed in relation to their present, rather than future value when comparing investment options. The interest rate at which money can be borrowed or invested, the cost of capital, is called the **discount rate** for TVM calculations. Some of the costs of the system will be accrued in after implementation. Before cost-benefit analysis, these costs should be brought back to current

dollars. **Present value** is the current value of a dollar at any time in the future. It is calculated using formula:

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

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

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

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

A graphical representation of this analysis is shown in Figure below. Using the information from the economic analysis, PVF's Systems Priority Board will be in a much better position to understand the potential economic impact of the Customer Tracking System. Without this information, it would be virtually impossible to know the cost-benefits of a proposed system and would be impossible to make an informed decision on approving or rejecting the service request. You can use many techniques to compute a project's economic feasibility. Because most information systems have a useful life of more than one year and will provide benefits and incur expenses for more than one year, most techniques for analyzing economic feasibility employ the concept of the time value of money, TVM. Table below describes three commonly used techniques for conducting economic feasibility analysis.

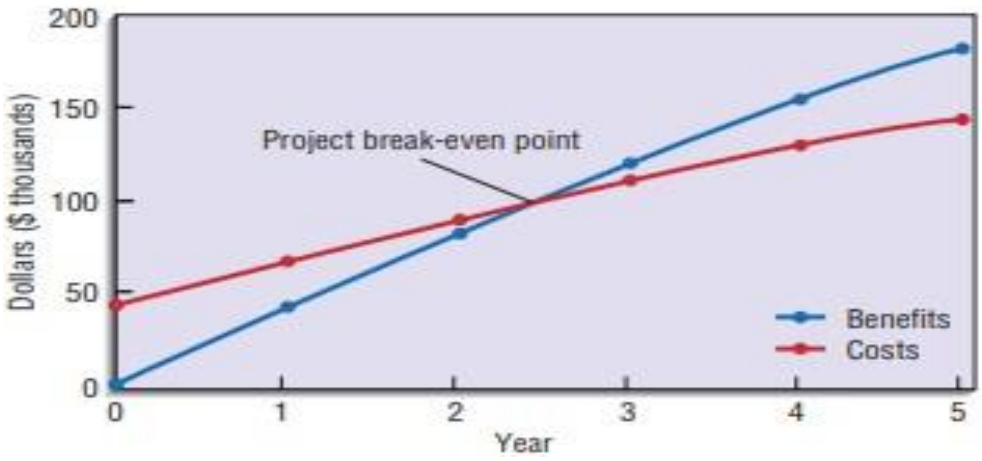


Figure: Break-even analysis

Table: Commonly Used Economic Cost-Benefit Analysis Techniques

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

A system project, to be approved for continuation, a systems project may not have to achieve break-even or have an ROI greater than estimated during project initiation and planning. Because you may not be able to quantify many benefits or costs at this point in a project, such financial hurdles for a project may be unattainable. In this case, simply doing as thorough an economic analysis as possible, including producing a long list of intangibles, may be sufficient for the project to progress. One other option is to run the type of economic analysis shown in Figure above using pessimistic, optimistic, and expected benefit and cost estimates during project initiation and planning. This range of possible outcomes, along with the list of intangible benefits and the support of the requesting business unit, will often be enough to allow the project to

continue to the analysis-phase. You must, however, be as precise as you can with the economic analysis, especially when investment capital is scarce. In this case, it may be necessary to conduct some typical analysis-phase activities during project initiation and planning in order to clearly identify inefficiencies and shortcomings with the existing system and to explain how a new system will overcome these problems.

Assessing Other Feasibility Concerns

You may need to consider other feasibility studies when formulating the business case for a system during project planning. **Operational feasibility** is the process of examining the likelihood that the project will attain its desired objectives. The goal of this study is to understand the degree to which the proposed system will likely solve the business problems or take advantage of the opportunities outlined in the system service request or project identification study. In other words, assessing operational feasibility requires that you gain a clear understanding of how an IS will fit into the current day-to-day operations of the organization. The goal of **technical feasibility** is to understand the development organization's ability to construct the proposed system. This analysis should include an assessment of the development group's understanding of the possible target hardware, software, and operating environments to be used, as well as, system size, complexity, and the group's experience with similar systems. **Schedule feasibility** considers the likelihood that all potential time frames and completion date schedules can be met and that meeting these dates will be sufficient for dealing with the needs of the organization. For example, a system may have to be operational by a government-imposed deadline by a particular point in the business cycle (such as the beginning of the season when new products are introduced), or at least by the time a competitor is expected to introduce a similar system.

Assessing **legal and contractual feasibility** requires that you gain an understanding of any potential legal and contractual ramifications due to the construction of the system. Considerations might include copyright or nondisclosure infringements, labor laws, antitrust legislation (which might limit the creation of systems to share data with other organizations), foreign trade regulations (e.g., some countries limit access to employee data by foreign corporations), and financial reporting standards as well as current or pending contractual obligations. Typically, legal and contractual feasibility is a greater consideration if your

organization has historically used an outside organization for specific systems or services that you now are considering handling yourself. Assessing **political feasibility** involves understanding how key stakeholders within the organization view the proposed system. Because an information system may affect the distribution of information within the organization, and thus the distribution of power, the construction of an IS can have political ramifications. Those stakeholders not supporting the project may take steps to block, disrupt, or change the project's intended focus.

Building and Reviewing the Baseline Project Plan

Building the Baseline Project Plan

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

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

Table: Outline of a baseline project plan

BASELINE PROJECT PLAN REPORT
1.0 Introduction A. Project Overview—Provides an executive summary that specifies the project's scope, feasibility, justification, resource requirements, and schedules. Additionally, a brief statement of the problem, the environment in which the system is to be implemented, and constraints that affect the project are provided. B. Recommendation—Provides a summary of important findings from the planning process and recommendations for subsequent activities.
2.0 System Description A. Alternatives—Provides a brief presentation of alternative system configurations. B. System Description—Provides a description of the selected configuration and a narrative of input information, tasks performed, and resultant information.
3.0 Feasibility Assessment A. Economic Analysis—Provides an economic justification for the system using cost-benefit analysis. B. Technical Analysis—Provides a discussion of relevant technical risk factors and an overall risk rating of the project. C. Operational Analysis—Provides an analysis of how the proposed system solves business problems or takes advantage of business opportunities in addition to an assessment of how current day-to-day activities will be changed by the system. D. Legal and Contractual Analysis—Provides a description of any legal or contractual risks related to the project (e.g., copyright or nondisclosure issues, data capture or transferring, and so on). E. Political Analysis—Provides a description of how key stakeholders within the organization view the proposed system. F. Schedules, Timeline, and Resource Analysis—Provides a description of potential time frame and completion-date scenarios using various resource allocation schemes.
4.0 Management Issues A. Team Configuration and Management—Provides a description of the team member roles and reporting relationships. B. Communication Plan—Provides a description of the communication procedures to be followed by management, team members, and the customer. C. Project Standards and Procedures—Provides a description of how deliverables will be evaluated and accepted by the customer. D. Other Project-Specific Topics—Provides a description of any other relevant issues related to the project uncovered during planning.

The purpose of the **introduction** is to provide a brief overview of the entire document and outline a recommended course of action for the project. The introduction is often limited to only

a few pages. Although it is sequenced as the first section of the BPP, it is often the final section to be written. It is only after performing most of the project planning activities that a clear overview and recommendation can be created. One initial activity that should be performed is the definition of the project scope, its range, which is an important part of the BPP's introduction section.

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

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

In the third section of the BPP, **feasibility assessment**, the systems analyst outlines project costs and benefits and technical difficulties. This section is where high-level project schedules are specified using Network diagrams and Gantt charts.

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

Reviewing the Baseline Project Plan

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

Most walk-through are not rigidly formal or exceedingly long in duration. It is important, however, to establish a specific agenda for the walk-through meetings, there is a need to have individuals play specific roles. These roles are as follows:

- **Coordinator.** This person plans the meeting and facilitates a smooth meeting process. This person may be the project leader or a lead analyst responsible for the current life cycle step.
- **Presenter.** This person describes the group. The presenter is usually an analyst who has done all or some of the work being presented.
- **User.** This person (or group) makes sure that the work product meets the needs of the project's customers. This user would usually be someone not on the project team.
- **Secretary.** This person takes notes and records decisions or recommendations made by the group. This may be clerk assigned to the project team or it may be one of the project team.
- **Standards bearer.** The role of this person is to ensure that the work product adheres to organizational technical standards. Many larger organizations have staff groups within the unit responsible for establishing standard procedures methods, and documentation formats. These standards bearers validate the work so that it can be used by others in the development organization.

- **Maintenance oracle.** This person reviews the work product in terms of future maintenance activities. The goal is to make the system and its documentation easy to maintain.

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

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

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

Walk-through is used throughout the duration of the project for briefing team members and external stakeholders. These presentations can provide many benefits to the team, but, unfortunately, are often not well done. With the proliferation of computer technology and the availability of powerful software to assist in designing and delivering presentations, making an effective presentation has never been easier. Microsoft's Power Point has emerged as the defector standard for creating computer-based presentations. Although this program is relatively easy to use, it can also be misused such that the "bells and whistles" added to a computer-based presentation actually detract from the presentation. Like any project, to make an effective presentation it must be well-planned, well-designed, and well-delivered.