

## UNIT-2

### Planning

#### \* Identifying and Selecting System Development Projects:

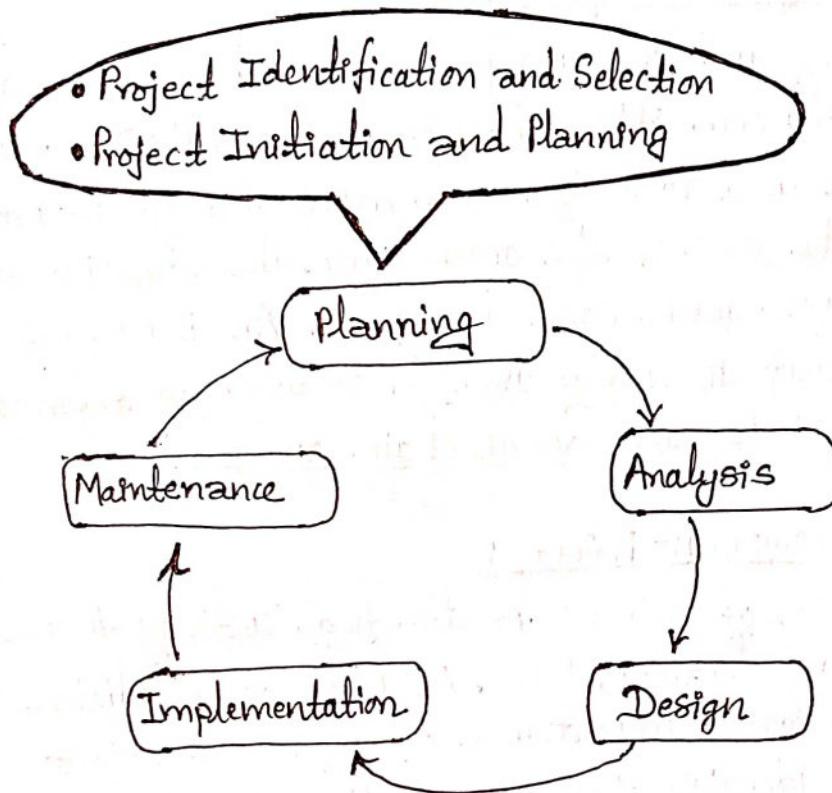


Fig: SDLC with project identification and selection.

The first phase of SDLC is planning, consisting of project identification and selection, and project initiation and planning as shown in the figure. During project identification and selection, a senior manager, a business group, an IS manager, or a committee identifies all possible systems development projects that an organization unit could undertake. Next, those projects are given available resources and are selected for subsequent development activities.

#### Process of Identifying and Selecting IS Development Projects:- [Imp]

Project identification and selection consists of three primary activities which are ~~also~~ described below:

- 1) Identifying Potential Development Projects: This process can be performed by:
  - A key member of top management, either the CEO of an organization or a senior executive of 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.
- The development group or a senior IS manager.

### ii) Classifying and Ranking Projects:

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. The criterias are cost, duration, complexity, system size and focus. An important project evaluation method that is widely used for assessing information systems development projects is called value chain analysis.

### iii) Selecting IS Development Projects:

The selection of projects is the final activity in the project identification and selection phase. As business conditions change over time, the relative importance of any single project may change. Thus, the identification and selection of projects is an important and ongoing activity. Numerous factors must be considered when selecting a project, these factors include:

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

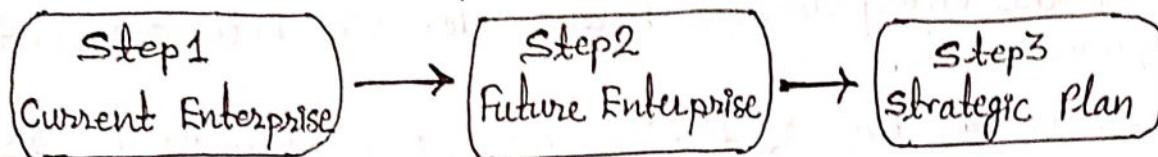
### Deliverables and Outcomes:

The primary deliverable, or end product, from the project identification and selection phase is a schedule of specific IS development projects. An outcome is the assurance that people in the organization gave careful consideration to project selection and clearly understood how each project could help the organization to reach its objectives. Incremental commitment is a strategy in system analysis and design in which the project is reviewed after each phase and continuation of project is rejustified in each of these reviews.

## ④ Corporate and Information Systems Planning:

### Corporate Strategic Planning:-

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



The first step focuses on gaining and understanding of the current enterprise. Second step focuses on where it wants the enterprise to be in future. Finally third step, focuses on a strategic plan which can be developed to guide transition. Corporate strategic planning is the ongoing process that defines the mission, objectives and strategies of an organization.

### Information Systems Planning:-

Information Systems Planning (ISP) is an orderly means of assessing the information needs of an organization and defining the information systems, databases, and technologies that will best satisfy those needs. ISP is a three step-process as follows:

#### Step 1: Current Situation:

- ↳ Listing of manual and automated processes.
- ↳ Listing of manual and automated data.
- ↳ Technology inventory.
- ↳ Human resources inventory.

#### Step 2: Future Situation:

- ↳ Blueprints of manual and automated processes.
- ↳ Blueprints of manual and automated data.
- ↳ Technology blueprints.
- ↳ Human resources blueprints.

#### Step 3: Schedule of Projects.

## ④ Components of a typical information systems plan:

- ① Organizational Mission, Objectives, and Strategy: Briefly describes the mission, strategy and objectives of the organization. The current and future views of the company are also briefly presented.
- ② Information Inventory: This section provides summary of the various business processes, functions, data entities, and information needs of the enterprise. The inventory will view both current and future needs.
- ③ Mission and Objectives of IS: Description of the primary role IS will play in the organization to transform the enterprise from its current to future state.
- ④ Constraints on IS Development: Briefly describes limitations imposed by technology and current level of resources within the company.
- ⑤ Conclusions: Contains likely but not-yet certain events that may affect the plan, and a description of their estimated impact on the plan.

## ④ Initiating and Planning Systems Development Projects:

Many activities performed during initiation and planning could also be completed during the next phase of the SDLC—systems analysis. Proper and insightful project initiation and planning, including determining project scope and identifying project activities, can reduce the time needed to complete later project phases, including systems analysis.

Most organizations assign an experienced system analyst, or a team of analysts, for large projects, to perform project initiation and planning. The objective of project initiating and planning is to transform a unclear system request document into a tangible project. Effective communication among the systems analysts, users, and management is essential for the creation of meaningful project plan. Projects at large, complex organizations require systems analysts to take more time to analyze both the current and proposed systems.

## Process of Initiating and Planning Systems Development Projects:

Two major activities occur during project initiation and planning. Project initiation focuses on activities that will help organize a team to conduct project planning. The second activity project planning focuses on defining clear, discrete tasks and the work needed to complete each task.

The objective of the project planning process is to produce two documents: a baseline project plan (BPP) and the project scope statement (PSS). The BPP becomes the foundation for the remainder of the development project. The PSS clearly outlines the objectives of the project for the customer.

### Deliverables and Outcomes:

The major outcomes and deliverables from project initiation and planning are the baseline project plan and the project scope statement. The BPP contains all information collected and analyzed during the project initiation and planning. The plan contains best estimate of the projects cost, scope, benefits, risks and resource requirements. The BPP becomes the foundation for all subsequent SDLC activities.

### ④ Assessing Project Feasibility: [Imp]

A feasibility study is an analysis that considers all of a project's relevant factors including economic, technical, legal and scheduling considerations to ascertain the likelihood of completing the project successfully. Whether a project is feasible or not can depend on several factors, including the project's cost and return on investment.

#### ④ Why do we need feasibility study?

→ We need feasibility study for following reasons:

- i) It helps to define our goals and objectives.
- ii) It helps us to develop a plan.
- iii) It helps to execute the developed plan.
- iv) It gives us an identity.
- v) It improves the attention of project teams.

W) Reduces the number of business options.

## ④ Types of Project Feasibility: [Imp]

### 1) Economic Feasibility / Cost-benefit analysis:

Economic feasibility or Cost-benefit analysis is the analysis of system if the expected benefit equal or exceed the expected costs. The main purpose is to identify the financial benefits and costs associated with the development project.

During project initiation and planning, it will be impossible for us to define precisely all benefits and costs related to a particular project. We review worksheets to record costs and benefits. These worksheets are used after each SDLC phase to decide whether to continue, redirect, or kill a project.

### 2) Technical Feasibility:

Assessing technical feasibility is to evaluate whether the new system will perform adequately and whether an organization has ability to construct a proposed system or not. All projects have risk and that risk is not necessarily something to avoid. Organizations typically expect a greater return on their investment for riskier projects. Potential risks need to be identified as early as possible in their project.

The amount of technical risk associated with a given project depends on four primary factors: project size, project structure, the development group's experience with the application and technology area, and the user group's experience with systems development projects and the application area.

### 3) Operational Feasibility:

Assessing operational feasibility is to gain an understanding of whether the proposed system will likely to solve the business problems, or take advantage of opportunities or not. It is important to understand how the new systems will fit

into the current day-to-day operations of the organization.

It is not only important to evaluate whether a system can work, but also evaluate whether a system will work. A workable solution might fail because of the end-user such as how long will the working environment of the end-users change, or whether end-users will adopt to that change.

#### 4) Schedule Feasibility:

Assessing schedule feasibility is to access the duration of the project whether it is too long to be complete before it is useful. System analysts have to estimate how long the system will take to develop.

Furthermore, the learning curve of the new technology and new system should be considered. We may have the technology, but that doesn't mean we have the skills required to properly apply that technology. Even though all information system professionals can learn new technologies, the learning curve will specifically impact the schedule feasibility.

#### 5) Legal and Contractual Feasibility:

Legal feasibility determines whether the proposed system conflicts with the legal requirement or not. A project may face legal issues after completion if this factor is not considered at the first stage. The possible considerations might include copyright, labour laws, creation of data to share data with other organizations etc.

#### 6) Political Feasibility:

Assessing political feasibility is to gain an understanding of how key stakeholders within the organization view the proposed system. Information system may affect the distribution of information within the organization and thus the distribution of power. Those stakeholders not supporting the project may take steps to block, disrupt or change the intended focus of the project.

## ④ Steps of Cost-benefit analysis: [Imp]

1) Determining Project Benefits → Project Benefits are both tangible and intangible. Tangible benefits refer to items that can be measured in dollars and with certainty. All tangible benefits can be easily quantified. Examples of tangible benefits might include reduced personnel expenses, lower transaction costs, or higher profit margins.

Intangible benefits refer to items that cannot be easily measured in dollars and with certainty. These benefits may have direct organizational benefits, such as the improvement of employee morale, or they may have broader societal implications, such as reduction of waste creation or resource consumption.

2) Determining Project Costs → An information system can have both tangible and intangible costs. The goal of a cost-benefit analysis is to accurately determine the total cost of ownership (TCO) for an investment. A one-time cost refers to a cost associated with project initiation and development and the start-up of the system.

## ⑤ Commonly used Cost-Benefit Analysis Techniques:

1) Net Present Value: 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 in  $n$  years from now when  $i$  is the discount rate. The rate at which money can be borrowed or invested is referred to as discount rate. To calculate net present value (NPV), simply add the present values calculated previously.

3) Return on Investment (ROI): It equals to net cash receipts of the project divided by the cash outlays of the project. Firms choose the project that provides the highest ROI.

$$\text{Overall return on investment (ROI)} = \frac{\text{Overall NPV}}{\text{NPV of all costs}}$$

### 3) Break-Even Analysis: [Imp]

Break-Even Analysis is a type of cost benefit analysis to identify at what point benefits equal costs.

$$\text{Break-even ratio} = \frac{\text{Yearly NPV cash flow} - \text{Overall NPV cash flow}}{\text{Yearly NPV cash flow}}$$

The break-even point is usually expressed as the amount of revenue, that must be realized for the firm to have neither profit or loss. It uses a minimum revenue target. It can be expressed in numbers or by use of graphs.

Q. Assuming monetary benefits of an information system at \$85,000 per year, one-time costs of \$75,000, recurring costs of \$35,000 per year, a discount rate of 12 percent, and a five-year time horizon, calculate the net present value of these costs and benefits of an information system. Also calculate the overall return on investment of the project and then present a break-even analysis. At what point does breakeven occur? [10 marks]

Solution:

Given, Monetary benefits of an IS = \$85,000 per year (Y).

One-time costs = \$75,000

Recurring costs = \$35,000 per year (g)

Discount rate = 12% ( $\frac{1}{100}$ )

Time period = 5 years (n).

Present value of Benefits or Costs can be calculated using formula:

$PV_n = Y \times \frac{1}{(1+i)^n}$ , where  $PV_n$  is present value of Y dollars in n years from now where i is the discount rate.

Benefits start from year 1, so the calculation of PV from year 1 onwards is as follows:

$$PV_1 = 85,000 \times \frac{1}{(1+0.12)^1} = 75,893$$

$$PV_2 = 85,000 \times \frac{1}{(1+0.12)^2} = 67,761$$

$$PV_3 = 85,000 \times \frac{1}{(1+0.12)^3} = 60,501$$

$$PV_4 = 85,000 \times \frac{1}{(1+0.12)^4} = 54,019$$

$$PV_5 = 85,000 \times \frac{1}{(1+0.12)^5} = 48,231$$

Now, Net Present Value of Benefits (NPV) =  $PV_1 + PV_2 + PV_3 + PV_4 + PV_5$   
= 75,893 + 67,761 + 60,501 +  
54,019 + 48,231  
= 306405

### Present value (PV) calculations for costs:

Here, the one-time cost \$75,000 is treated as cost occurring in year 0 (now).

$$PV_0 = 75,000 \times \frac{1}{(1+0.12)^0} = \$75,000$$

Recurring cost \$35,000 happens every year starting at year 1.

$$PV_1 = 35,000 \times \frac{1}{(1+0.12)^1} = 31,250$$

$$PV_2 = 35,000 \times \frac{1}{(1+0.12)^2} = 27,901$$

$$PV_3 = 35,000 \times \frac{1}{(1+0.12)^3} = 24,912$$

$$PV_4 = 35,000 \times \frac{1}{(1+0.12)^4} = 22,243$$

$$PV_5 = 35,000 \times \frac{1}{(1+0.12)^5} = 19,860$$

Net present value of costs (NPV) =  $PV_0 + PV_1 + PV_2 + PV_3 + PV_4 + PV_5$   
= 75,000 + 31,250 + 27,901 + 24,912 + 22,243 + 19,860.  
= 201168

Then, Overall NPV = (NPV of all Benefits - NPV of all costs)  
= 306405 - 201168  
= 105239

And, Overall return on investment (ROI) =  $\frac{\text{Overall NPV}}{\text{NPV of all costs}} = \frac{105239}{201168} = 0.523$

Again, Break-even ratio =  $\frac{\text{Yearly NPV Cash Flow} - \text{Overall NPV cash flow}}{\text{Yearly NPV cash flow}}$

So, Yearly NPV cash flow = P.V of Benefits - P.V of Recurring costs.

Here, P.V of benefit for one time cost is 0.

So, yearly NPV cash flow at year 0 = \$75,000

$$\begin{aligned}\text{Yearly NPV cash flow at year 1} &= \text{P.V}_1 \text{ of benefit} - \text{P.V}_1 \text{ of recurring costs} \\ &= \$75,893 - \$31250 \\ &= 44,643\end{aligned}$$

Similarly Yearly NPV cash flow at year 2 = \$67,761 - \$27,901 = 39860.

Yearly NPV cash flow at year 3 = \$60,501 - \$24,912 = 35589

Yearly NPV cash flow at year 4 = \$54,019 - \$22,243 = 31,776

Yearly NPV cash flow at year 5 = \$48,231 - \$19,860 = 28371

Now, Overall cash flow for one time cost i.e., 0 year is -\$75,000

Since, Overall NPV cash flow for  $q^{th}$  year = Yearly NPV cash flow for  $q^{th}$  year + cash flow for  $(q-1)^{th}$  year.

Overall NPV cash flow for 1<sup>st</sup> year = \$44,643 + (-\$75,000) = -\$30357

Overall NPV cash flow for 2<sup>nd</sup> year = 39,860 + (-30357) = 9503

Overall NPV cash flow for 3<sup>rd</sup> year = 35589 + 9503 = 45092

Overall NPV cash flow for 4<sup>th</sup> year = 31776 + 45092 = 76868

Overall NPV cash flow for 5<sup>th</sup> year = 28371 + 76868 = 105239.

Here, the break-even occurs between years 1 and 2 because year 2 is first in which overall NPV cash is non-negative.

So, Break-even ratio =  $\frac{39860 - 9503}{39860} = 0.76$

between 1 & 2 so  
finally 1.76 written  
if it was 2 & 3 st  
would be 2.76 and  
so on.

Therefore, project break-even occurs at approximately in 1.76 years.

We can solve this making table also to make it shorter like given in foreign books and other resources. But it is easier to understand each step by this process so to understand we proceed by this.

## Q. Building and Reviewing the Baseline Project Plan:

A baseline in project management is clearly defined starting point for our project plan. It is a fixed reference point to measure and compare our project's progress. This allows us to access the performance of our project over time.

### Building Project Baseline:

To set a project baseline, first we must determine the scope of our project. This can be done with a scope statement which is a list of project objectives and deliverables. Now, we break down all the work required to achieve these deliverables into individual tasks and subtasks with detailed descriptions.

Next we must map out our project schedule clearly defined due dates and a final deadline. A good tool for this is Gantt Chart. After that, we should plan the total cost of project. It includes relevant factors like hourly rates, available resources etc. Finally, project baseline must be clearly outlined before we can move to next stage.

### Reviewing Projects Baseline:

After building project baseline, management, users and development team will review the document. A project baseline should be documented and controlled. It should not change without following formal change control procedures.

A common method for performing review is called a structured walk-through. Walk-throughs are peer group reviews of any product created during the systems development process and are widely used by professionals development organizations.