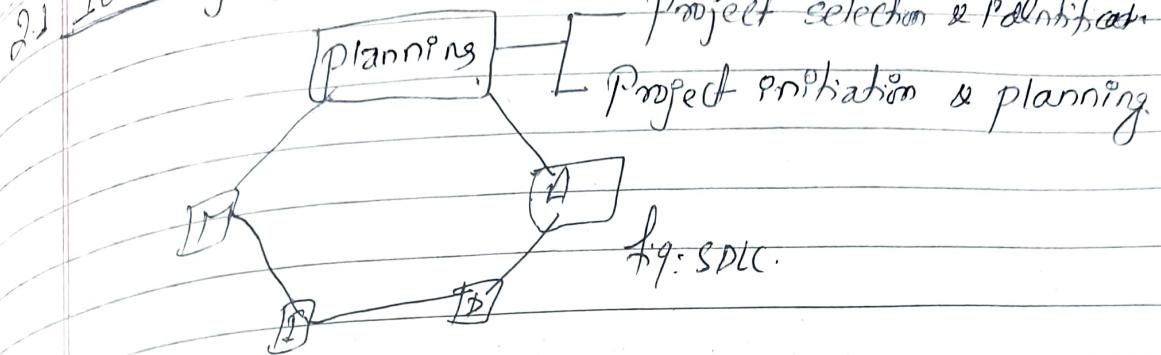


## Unit 2 : Planning

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### 2.1 Identifying and selecting Systems Development Project.



#### \* Introduction:

Planning is the first phase of SDLC. It consists of two parts: Project selection & identification and project initiation and planning. These two parts are described below:

#### \* Process of Identifying & Selecting Syst Is dev. proj.

- The 1st activity of system planning phase of the SDLC is project identification and selection.
- Organizations vary in their approach to identifying and selecting projects.
- In some organizations, project identification & selection is a formal process in which projects are outcomes of larger overall planning process.
- It involves evaluating potential projects based on various criteria such as feasibility, alignment with organizational goals & objectives, & potential Return on Investment (ROI).

• Project Identification and selection consists of three primary activities

- Identifying potential projects
- Classifying and ranking projects
- Selecting projects for development

### i) Identifying potential projects

- This process can be performed by:
- A key member of top management, either CEO or any top executive of the organization
  - A group of managers from different departments who are interested in the project (Steering committee)
  - The department that will use the project, like the head of the department or a group from that department. (User departments)
  - The development group or senior IS manager

### ii) Classifying and ranking projects

- After the potential projects are selected for development, the next step is to classify and rank those projects.
- It is performed by the top management, steering committee and the development groups.
- Projects are classified and ranked based on the evaluation criteria such as Value Chain analysis, potential benefits, project size & duration, technical difficulties and risks, resource availability & so on.

- Mostly used evaluation criteria is value chain analysis. VCA can help companies identify which activities add the most value to their products or services. And based on this, projects are classified and ranked.

## Selecting Projects for development

- The selection of IS (Information System) project is the final activity of project identification & selection phase.
- Those projects that align most with the organizational goals and objectives are selected. Both short-term & long-term projects are considered.
- Various factors like existing systems & ongoing projects, resource availability, current business conditions are considered for the selection of projects.
- These projects come from both top-down & bottom-up sources & once selected they move into the second activity - project initiation and planning.  
 (continue from process of Ident. select. points)

After the process of identifying & selecting projects, the possible outcomes are:

- Project acceptance.
- Project rejection.
- Proof of concept
- Assurance of people in the organization about the selection of project and how those project help organization to reach its objectives.

- The main/primary deliverable from this activity is the schedule of the selected projects for development.
- Another deliverable or outcome is the Incremental Commitment, which means the project is reviewed after each phase of development in SDLC.

## Corporate and Information Systems planning

### Corporate strategic planning

- Corporate Strategic planning is the way of figuring out how a company should grow and change in the future. It's a process that helps decide the company's goal & how to achieve them.
- In other words, Corporate Strategic planning is an ongoing process that defines the mission, objectives and strategy of an organization.
- It is a three step process  
 [Current Enterprise] → [Future enterprise] → [Strategic plan].

Step-1: Understanding the current enterprise of the company (knowing where the company is now)

Step-2: Deciding where the company wants to be in future. (What the company wants to achieve). It is the role of top management.

Step-3: Making a Strategic plan to reach those goals  
(how the company will get there).

- During this process, top level managements will make important decision about the Company's organizations objectives, mission, goals & how to reach them. This will help the organization move forward & achieve success
- CS results in several outcomes:
  - Mission Statement:
  - Statement of objectives
  - Competitive Strategy.

## Information Systems planning.

- Information system planning is a way to figure out what information an organization needs and what kind of systems, databases and technology will help the organization get that information
- This process looks at both the current & future information needs of the organization, and makes a plan to move the organization's current systems & technology to what the organization will need in the future.
- It is also a three-step activities modeling process:
  - Describe the current situation
  - Describe the target (or future) situation
  - Develop a transition plan & strategy.

- o Describe the current situation
    - ↳ The most common way to understand how an organization is doing right now is called top-down planning. This way of looking at the organization tries to understand the information needs of whole company.
    - ↳ Another way to understand the company is called bottom-up planning. This way of looking at the company focuses on specific project that will solve a problem or take advantage of business opportunity.
  - o Describe the target situation
    - ↳ The next step of Tsp process is to define the target situation that reflects the desired future state of an organization.
    - ↳ It's important to think about what might be happening in the future that could affect the organization & then make a plan that takes those things into account.
    - ↳ After that the plan will show what the company/ma needs to do to get to where it wants to be.
  - o Develop a transition plan & strategy
    - ↳ The PS planning team creates a plan for how the organization/Company should change to reach the desired future state.
    - ↳ The plan is a very detailed document that covers both short term & long term goals for the organization development.
  - o Components of a typical information systems plan are:  
*classmate*
    - Organizational mission objectives & strategy, mission & Objectives of IS, constraints on IS development, PAGE 

1	2	3
4	5	6
7	8	9

 conditions,

## 2.2 Initiating and Planning Systems Development Projects

### \* Introduction:

During the 1st phase, we talked about project identification and selection. It is also known as "pre project" step in the life cycle because it is only about noticing that the new system is required.

The next step is project initiation & planning. It is about figuring out if it's possible to make the system with the resources available & deciding whether to move forward with making it or not. This is the step where projects are accepted for development, redirected or rejected.

### \* Process of Initiating and planning Ts development project

- When an organization wants to build a project, it usually assigns experienced system analyst or a team to perform project initiation and planning
- Experienced analysts work with end users to figure out what they need.
- The goal of this planning step is to take a general idea for a new system & turn it into a specific plan for building it.
- Project initiation focuses on activities that will help organize a team to conduct project planning. The major activities during project initiation is:

- Establishing the project initiation team & plan
- Establishing the relationship with the customer
- Establishing project management procedure & Environment

- o Project planning focuses on defining clear, discrete tasks and the work needed to complete each task. It will produce two documents: Base Line Project Plan (BPP) & Project Scope Statement (PSS). The major activities are:

- Describing project scope, feasibility.
- Dividing the project into manageable tasks
- Developing a preliminary schedule & budget
- Identifying & assessing risk.
- Developing a communication plan

## ~~X~~ Assessing Project Feasibility

- o The major deliverables or outcomes from this phase is the Base Line Project Plan and the Project Scope Statement.
- o A BPP is a document that outlines the specific details of a project, including the project's goals, tasks, timelines & resources. It serves as the reference point for the project team to track progress & make adjustments as necessary.
- o A PSS is a document that defines the boundaries of a project & outlines what is & is not included in the project's scope. It helps to ensure that everyone involved in the project has a clear understanding of project objectives & scopes.

# Assessing project Feasibility (Possibility)

A feasibility study is an evaluation of a project to determine whether it is technically and economically possible. Whether a project is possible/feasible or not can depend on several factors which are described below.

- o Economic Feasibility
- o Technical Feasibility
- o Operational Feasibility
- o Legal Feasibility
- o Schedule Feasibility

## Economic Feasibility

- It involves evaluating the financial aspect of the project, including costs and benefits, project budget & many more.
  - We determine whether
- Is it under budget?

How much economic advantages we can get it for our organization  
(Return on Investment)

## Technical Feasibility

- It involves evaluating whether the hardware or software required to develop any project are technically available or not.
- It also includes factors such as operating environments, system size, complexity, etc.
- It is basically the process to understand the development organization's ability to construct the proposed system.

## Operational Feasibility

- It involves evaluating whether the project is operationally practical, including the impact of the project on the organization & its operations (i.e. if the project solves the business ultimate problems or not).

- Determines if the software performs all the operations the way it should & whether the end user will adopt the software easily or not.

## Legal Feasibility

- It determines whether the proposed project system conflicts with the legal requirement or not.
- The possible considerations might include copyright, labour laws, sharing of data with other organizations, tax laws, etc.

## Schedule Feasibility

- It involves evaluating whether the project can be completed within the proposed time or deadline.
- It involves building project schedule, evaluating BPP, based on the available resources to complete the project.

## Political Feasibility

- It involves evaluating whether the project aligns with the requirements of stakeholders, such as political leaders, funding agencies, government etc.
- It also includes identifying potential political risks, such as change in government policies or regulations and so on.

# Cost-benefit Analysis (you can also describe this in Economic feasibility)

Cost-benefit Analysis (CBA) is a method used to evaluate the economic feasibility of a project by comparing the costs and benefits of project. There are two steps of CBA:

## i) Determining Project benefits

Project benefits can be both tangible & intangible. Tangible benefits are the measurable and quantifiable benefits of a project whereas intangible benefits can't be measured or quantified. Examples:

### Tangible benefits

- Increased revenue from new product
- Reduced costs
- Increased productivity
- Improved customer satisfaction
- Increased market share

### Intangible benefits

- Improved reputation
- Increased employee satisfaction
- Improved community relations
- Increased brand recognition

## ii) Determining project costs.

An information system can have both tangible and intangible costs. Here we, determine one-time cost which is a cost associated with project initiation & development & start-up.

### Tangible costs

- Hardware costs
- Labor costs
- Operational costs
- Cost of trainings

### Intangible costs

- Loss of customer goodwill
- operational inefficiency
- Loss of employee morale

## Some techniques for Cost-benefit analysis / Economic feasibility

### → Net present value (NPV)

It uses discount rate to determine present value of cash. Present value is the current value of cash at any time in the future. It is calculated by

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

Where,  $PV_n$  - Present value of  
dollars in  $n$  years from now  
 $i$  = discount rate.

**Note:** 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.

### → Return On Investment (ROI).

It is the ratio of net cash receipts of the project divided by the cash outlays of the project.

$$\text{Overall ROI} = \frac{\text{Overall NPV}}{\text{NPV of all cost}}$$

### → Break-Even Analysis

It is a type of CBA to identify at what point benefits equal costs. It can be expressed in numbers or by use of graph.

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

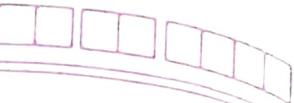
# Building and Reviewing the Baseline Project Plan (PPT)

## Building BPP

- All the information collected during project initiation and planning is collected and organized into a document called the BPP.
- It outlines the specific details of a project, including the project's goals, tasks, timelines & resources. ~~It serves as the reference point for the project team to track progress & make adjustments as needed.~~
- A baseline in a project plan is clearly a defined starting point for your project plan. It serves as a reference point to measure and compare the progress of your project. This allows you to identify the performance of your project over time and make adjustments as needed.

The steps of building BPP are:

- To set a project base line, we determine the scope of our project by listing project objectives & deliverables
- Then we break down all the work required to achieve the deliverables into individual tasks & subtasks.
- Next, we define project schedule i.e. due date & final deadline with the help of Gantt Chart.
- Then we plan the total cost of the project.
- Finally, project baseline must be clearly outlined before we move to the next stage.



- Reviewing BP
  - After building project baseline, management users & development team will review the document
  - A project baseline should be documented & controlled. It should not change without following formal procedure.
  - A common method for reviewing is called a structured walk-through.

Assuming monetary benefits of an Information system is \$ 85,000 per year, one-time costs of \$ 75,000, recurring costs of \$ 35,000 per year, a discount rate of 12% & a five-year time horizon. Calculate the net present value of these costs & benefits of an IS. Also calculate the overall return on Investment of the project & then present a break-even analysis. At what point does breakeven occur?

⇒ Monetary benefits of IS per year ( $Y$ ) = 85,000  
one-time costs = 75,000

Recurring costs ( $B$ ) = 35,000 per year

discount rate ( $i$ ) = 12% = 0.12

Time period ( $n$ ) = 5 years.

Net present value for ~~costs~~ benefits

Now, net present value for 5 years =  $PV_1 + PV_2 + PV_3 + PV_4 + PV_5$

$$\text{We know, } PV_n = \frac{Y}{(1+i)^n}$$

∴ Present-value from 1 year onwards ( $PV_1$ ) =  $\frac{85,000}{(1+0.12)^1} = 75,893$

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

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

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

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

∴  $NPV = 75,893 + 67,761 + 60,501 + 54,019 + 48,231$   
~~for benefit~~ = \$ 3,06,405

## Net present value for costs

Here, one-time cost is treated as cost occurring in year 0.

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

and Recurring costs happens every year starting at year 1

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

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

$$PV_3 = 24,912, \quad PV_4 = 22,243, \quad PV_5 = 19,860$$

$$\therefore \text{NPV of cost} = PV_0 + PV_1 + PV_2 + PV_3 + PV_4 + PV_5 \\ = \$2,01,168$$

$$\therefore \text{Overall NPV} = \text{NPV of all benefits} - \text{NPV of all costs} \\ = 306405 - 201168 \\ = \$105239$$

$$\therefore \text{Overall IOR} = \frac{\text{Overall NPV}}{\text{NPV of all costs}} = \frac{105239}{201168} = 0.523$$

Again,

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

Now,

Yearly NPV Cash flow = PV of Benefits - PV of recurring costs

Here, PV of benefit for one time cost is 0

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

$$\begin{aligned}\text{Yearly NPV cash flow at year 1} &= \text{PV of benefit} - \text{PV of recurring costs} \\ &= 75,893 - 31,250 \\ &= 44,643\end{aligned}$$

$$\text{Yearly NPV cash flow at Year 2} = 67761 - 22901 = 39860$$

$$\text{Yearly NPV cash flow at Year 3} = 60,501 - 24,912 = 35589$$

$$\text{Yearly NPV cash flow at Year 4} = 54019 - 22243 = 31776$$

$$\text{Yearly NPV cash flow at Year 5} = 48,231 - 19860 = 28371$$

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

Since, overall NPV cash flow for  $i^{th}$  year = Yearly NPV cash flow for  $i^{th}$  year + cash flow for  $(P-i)^{th}$  year  
 $\text{overall}$

$$\text{Overall NPV cash flow for 1st year} = 44,643 + (-75,000) = -30357$$

$$\text{Overall NPV cash flow for 2nd year} = 39860 + (-30357) = 9503$$

$$\text{Overall NPV cash flow for 3rd year} = 31776 + 9503 = 45092$$

$$\text{Overall NPV cash flow for 4th year} = 45092 + 31726 = 76868$$

$$\text{Overall NPV cash flow for 5th year} = 28371 + 76868 = 105239$$

Here, break-even occurs between year 1 & 2 because year 2 is 1st in which overall NPV cash is non-negative.

*classmate*

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

Break even point is 1.26 years

A system costs Rs. 1,00,000 to install & Rs. 8,000 per month as recurring expenses. The benefit per year is Rs. 1,50,000. Assuming an interest rate is 12%, what is the payback period of investment?

Given,

$$\text{One time cost} = \text{Rs. } 1,00,000$$

$$\text{Expenses per month} = \text{Rs. } 8,000$$

$$\therefore \text{Expenses per year} = 8,000 \times 12 = \text{Rs. } 96,000$$

$$\text{Benefits per year} = \text{Rs. } 1,50,000$$

$$\text{Interest rate} (i) = 12\% = 0.12$$

$$\text{We know, Actual benefit} = 1,50,000 - 96,000 = \text{Rs. } 54,000$$

$\therefore$  we calculate, ~~at~~ present value for benefit for each year till it crosses 1 lakhs. In NPV.

$$\text{PV for 1 year} = \frac{54,000}{(1+0.12)} = 48214$$

$$\text{PV for 2 years} = \frac{54,000}{(1+0.12)^2} = 43048$$

$$\text{PV for 3 years} = \frac{54,000}{(1+0.12)^3} = 38436$$

Total cash flow required to reach 1 lakhs:

$$48214 + 43048 + 38436 - 100000 \\ = 29698$$

Since, in between 2 & 3 years total cost is fulfilled so,

$$\frac{38436 - 29698}{38436} = 0.227$$

CLASSMATE Payback period = 2.227 years.

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Assuming monetary benefits of an information system of \$ 70,000 the first year & increasing benefits of \$ 10,000 a year for the next 4 years. One-time development costs of \$ 90,000 & recurring costs of \$ 40,000 per year over the duration of system's life. The discount rate for the company was 11%. Using a 5 year time horizon, calculate the net present value of these costs & benefits. Also calculate the overall return on investment & then present a break-even analysis. At what point does break-even occur?

i) Given, Monetary benefits ( $y$ ) = 70,000 (1st year)

Increasing benefits per year after 1st year = 10,000

One-time cost = 90,000

Rewurring cost = 40,000

Discount Rate ( $i$ ) = 11% = 0.11

No. of years	0	1	2	3	4	5
Cost ( $y$ )	90K	40K	40K	40K	40K	40K
Benefit ( $y$ )	-	70K	80K	90K	100K	110K

Net present value (NPV) of benefits (we know,  $PV_n = \frac{y}{(1+i)^n}$ )

$$\text{For 1st year, } PV_1 = \frac{70,000}{(1+0.11)^1} = 63064$$

$$\text{2nd year, } PV_2 = \frac{80,000}{(1+0.11)^2} = 64930$$

$$\text{3rd year, } PV_3 = \frac{90,000}{(1+0.11)^3} = 65808$$

$$\text{4th year, } PV_4 = \frac{100,000}{(1+0.11)^4} = 65874$$

$$\text{5th year, } PV_5 = \frac{110,000}{(1+0.11)^5} = 65280$$

$\therefore \text{Net Present value of benefit (NPU)}$

$$= 63064 + 64930 + 68808 + 66874 + 65280$$

$$\text{NPU}_{\text{benefit}} = 324956$$

### NPV of costs

$$\text{For year 0, } PV_0 = \frac{90,000}{(1+0.11)^0} = 90,000$$

$$\text{For year 1, } PV_1 = \frac{40,000}{(1+0.11)^1} = 36037$$

$$\text{For year 2, } PV_2 = \frac{40,000}{(1+0.11)^2} = 32465$$

$$\text{For year 3, } PV_3 = \frac{40,000}{(1+0.11)^3} = 29248$$

$$\text{For year 4, } PV_4 = \frac{40,000}{(1+0.11)^4} = 26350$$

$$\text{For year 5, } PV_5 = \frac{40,000}{(1+0.11)^5} = 23739$$

$\therefore \text{Net present value of costs} = 90,000 + 36037 + 32465 + 29248 + 26350 + 23739$

$$\text{NPV}_{\text{cost}} = 237839$$

Hence, Overall NPV =  $\text{NPV}_{\text{benefits}} - \text{NPV}_{\text{costs}}$

$$= 324956 - 237839$$

$$= 87117$$

$\therefore \text{Overall Return on Investment (ROI)} = \frac{\text{Overall NPV}}{\text{NPV}_{\text{costs}}}$

$$= \frac{87117}{237839} = 0.3662$$

Now,

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

\* we know, Yearly NPV cash flow

= PV of benefits of a year - PV of costs of that year.

∴ Yearly NPV cash flow :-

$$\text{For Year } 0 = 0 - 90000 = -90000$$

$$\text{For Year } 1 = 63064 - 36037 = 27027$$

$$\text{For Year } 2 = 64930 - 32465 = 32465$$

$$\text{For Year } 3 = 65808 - 29248 = 36560$$

$$\text{For Year } 4 = 65874 - 26350 = 39524$$

$$\text{For Year } 5 = 65280 - 23729 = 41541$$

\* Also, we know,

Overall NPV cash flow

= Yearly NPV Cash flow for  $i^{th}$  year + Overall NPV cash flow for  $(P-i)^{th}$  year.

∴ Overall NPV cash flow:

$$\text{For Year } 0 = -90000 + 0 = -90000$$

$$\text{For Year } 1 = 27027 + (-90000) = -62973$$

$$\text{For Year } 2 = 32465 + (-62973) = -30508$$

$$\text{For Year } 3 = 36560 + (-30508) = 6052$$

$$\text{For Year } 4 = 39524 + 6052 = 45576$$

$$\text{For Year } 5 = 41541 + 45576 = 87117$$

Hence, the break even point is between Year 2 and Year 3 since between Year 2 and Year 3 overall NPV cash flow turned positive.

$$\therefore \text{Break even ratio} = \frac{36560 - 6052}{36560} = 0.834$$