BACHELOR OF COMPUTER APPLICATION

LAB REPORT

Subject: Software Project Management

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1. Software Project Activity Planning

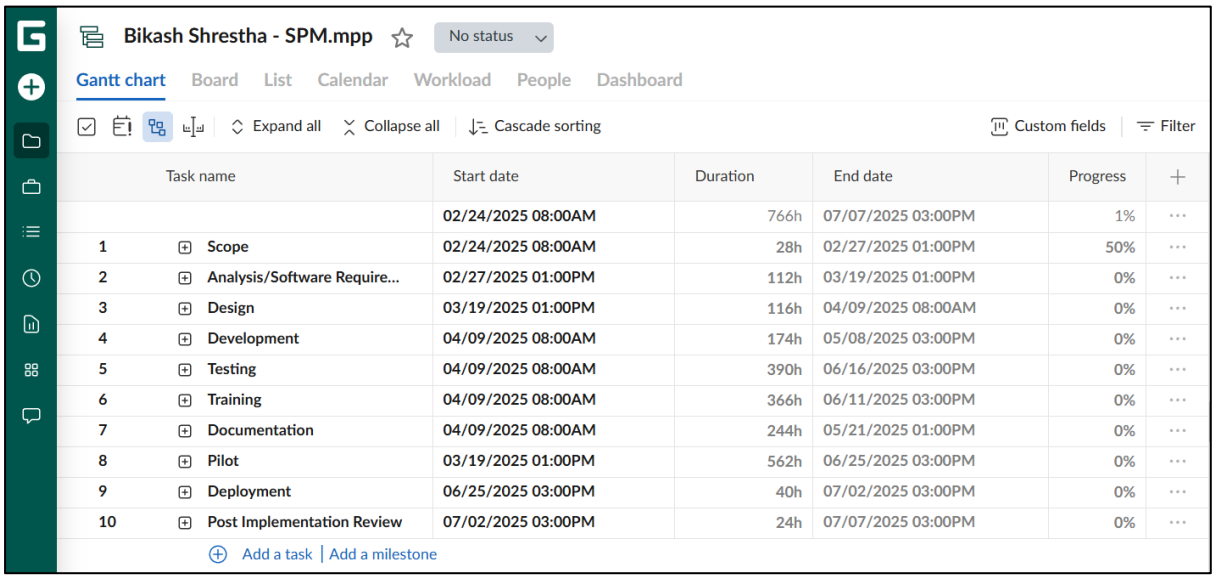
Theory:

Project management is the process of planning, organizing, and overseeing tasks to achieve specific goals within a set timeframe and budget. It involves coordinating resources, defining objectives, and managing risks to ensure successful project completion.

Gantt Pro:

In this report was prepared using Gantt Pro project management tool. It is an online project management tool that streamlines planning, scheduling, and collaboration through interactive Gantt charts. It helps teams visualize tasks, set dependencies, track progress, and share updates efficiently.

Project Planning:



	Task name	Start date	Duration	End date	Progress
		02/24/2025 08:00AM	766h	07/07/2025 03:00PM	1%
1	Scope	02/24/2025 08:00AM	28h	02/27/2025 01:00PM	50%
2	Analysis/Software Require...	02/27/2025 01:00PM	112h	03/19/2025 01:00PM	0%
3	Design	03/19/2025 01:00PM	116h	04/09/2025 08:00AM	0%
4	Development	04/09/2025 08:00AM	174h	05/08/2025 03:00PM	0%
5	Testing	04/09/2025 08:00AM	390h	06/16/2025 03:00PM	0%
6	Training	04/09/2025 08:00AM	366h	06/11/2025 03:00PM	0%
7	Documentation	04/09/2025 08:00AM	244h	05/21/2025 01:00PM	0%
8	Pilot	03/19/2025 01:00PM	562h	06/25/2025 03:00PM	0%
9	Deployment	06/25/2025 03:00PM	40h	07/02/2025 03:00PM	0%
10	Post Implementation Review	07/02/2025 03:00PM	24h	07/07/2025 03:00PM	0%

Figure 1. Project planning in Gantt Pro

2. Project Scheduling and WBS

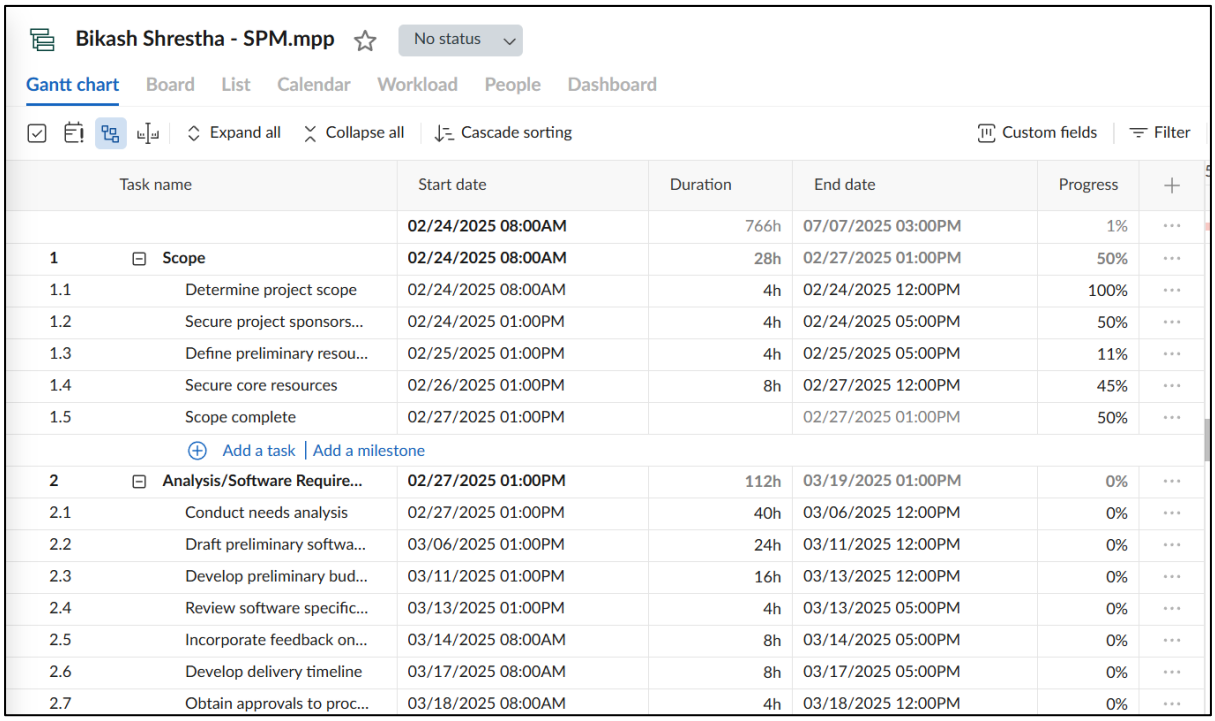
Theory:

A project schedule is a timetable that organizes tasks, resources and due dates in an ideal sequence so that a project can be completed on time. A project schedule is created during the planning phase and includes the following:

- A project timeline with start dates, end dates and milestones
- The work necessary to complete the project deliverables
- The costs, resources and dependencies associated with each task
- The team members that are responsible for each task

Work Breakdown Structure (WBS):

It is a project management technique used to break down complex projects into smaller, manageable components. It organizes tasks in a hierarchical structure, helping teams plan, allocate resources, and track progress efficiently.



	Task name	Start date	Duration	End date	Progress
		02/24/2025 08:00AM	766h	07/07/2025 03:00PM	1%
1	**Scope**	**02/24/2025 08:00AM**	28h	02/27/2025 01:00PM	50%
1.1	Determine project scope	02/24/2025 08:00AM	4h	02/24/2025 12:00PM	100%
1.2	Secure project sponsors...	02/24/2025 01:00PM	4h	02/24/2025 05:00PM	50%
1.3	Define preliminary resou...	02/25/2025 01:00PM	4h	02/25/2025 05:00PM	11%
1.4	Secure core resources	02/26/2025 01:00PM	8h	02/27/2025 12:00PM	45%
1.5	Scope complete	02/27/2025 01:00PM		02/27/2025 01:00PM	50%
2	**Analysis/Software Require...**	**02/27/2025 01:00PM**	112h	03/19/2025 01:00PM	0%
2.1	Conduct needs analysis	02/27/2025 01:00PM	40h	03/06/2025 12:00PM	0%
2.2	Draft preliminary softwa...	03/06/2025 01:00PM	24h	03/11/2025 12:00PM	0%
2.3	Develop preliminary bud...	03/11/2025 01:00PM	16h	03/13/2025 12:00PM	0%
2.4	Review software specific...	03/13/2025 01:00PM	4h	03/13/2025 05:00PM	0%
2.5	Incorporate feedback on...	03/14/2025 08:00AM	8h	03/14/2025 05:00PM	0%
2.6	Develop delivery timeline	03/17/2025 08:00AM	8h	03/17/2025 05:00PM	0%
2.7	Obtain approvals to proc...	03/18/2025 08:00AM	4h	03/18/2025 12:00PM	0%

Figure 2. 1 Work breakdown into tasks

Kanban:

It is a visual workflow management method used in project management and Agile development. It helps teams organize tasks, track progress, and optimize workflow efficiency using a structured board system.

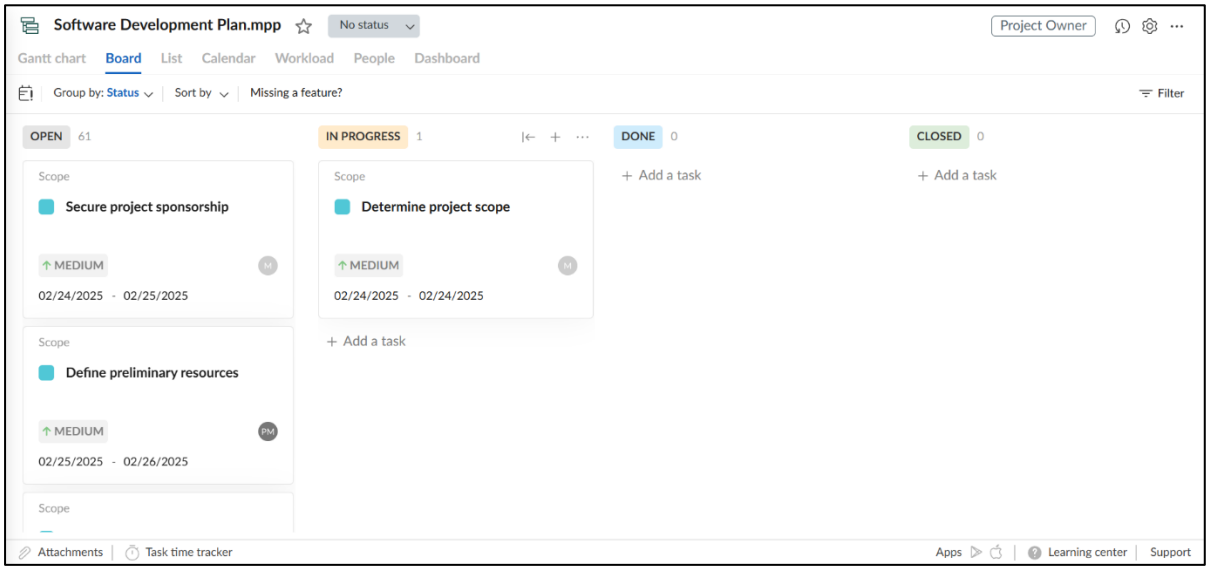


Figure 2. 2 Kanban-board view of tasks

Figure 2. 3 Workload assignment

Gantt Chart:

A Gantt chart is a project management tool used to visualize tasks, timelines, and dependencies in a structured, easy-to-read format. It helps teams plan, track progress, and manage schedules efficiently.

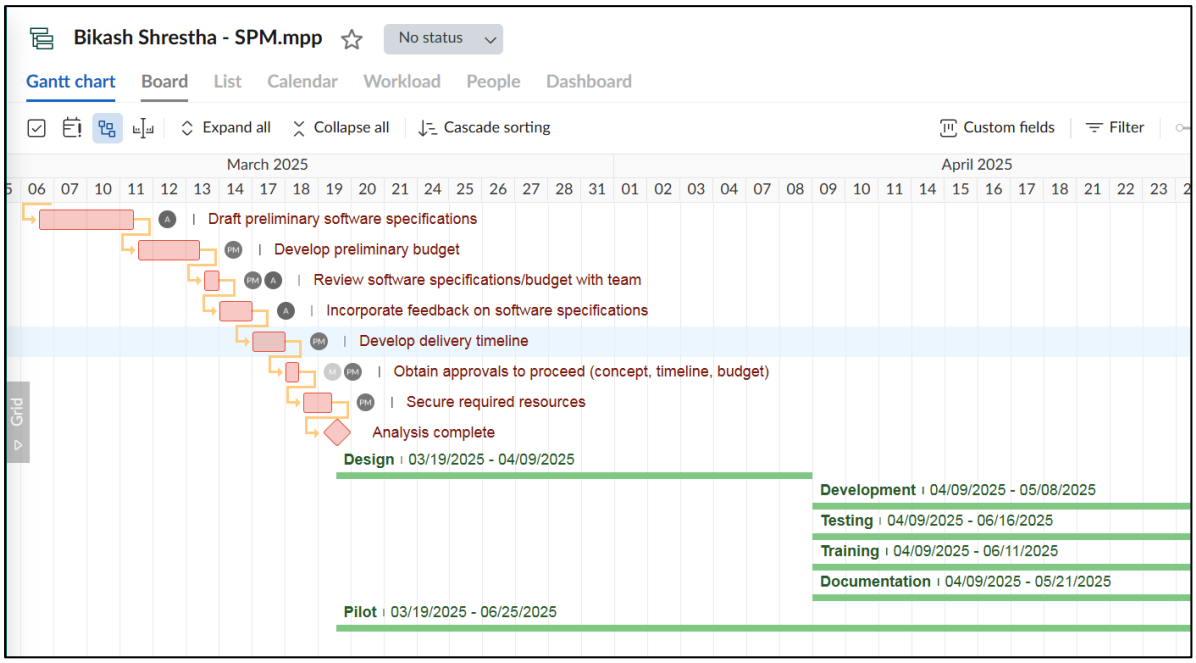


Figure 2. 4 Gantt Chart of the project by days

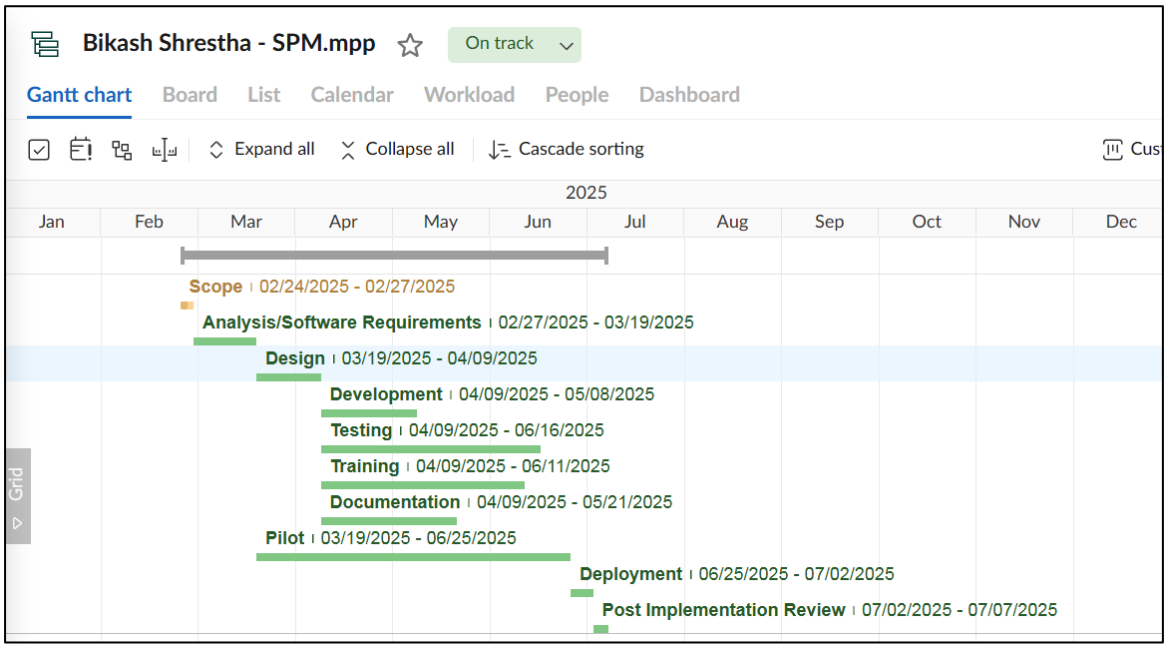


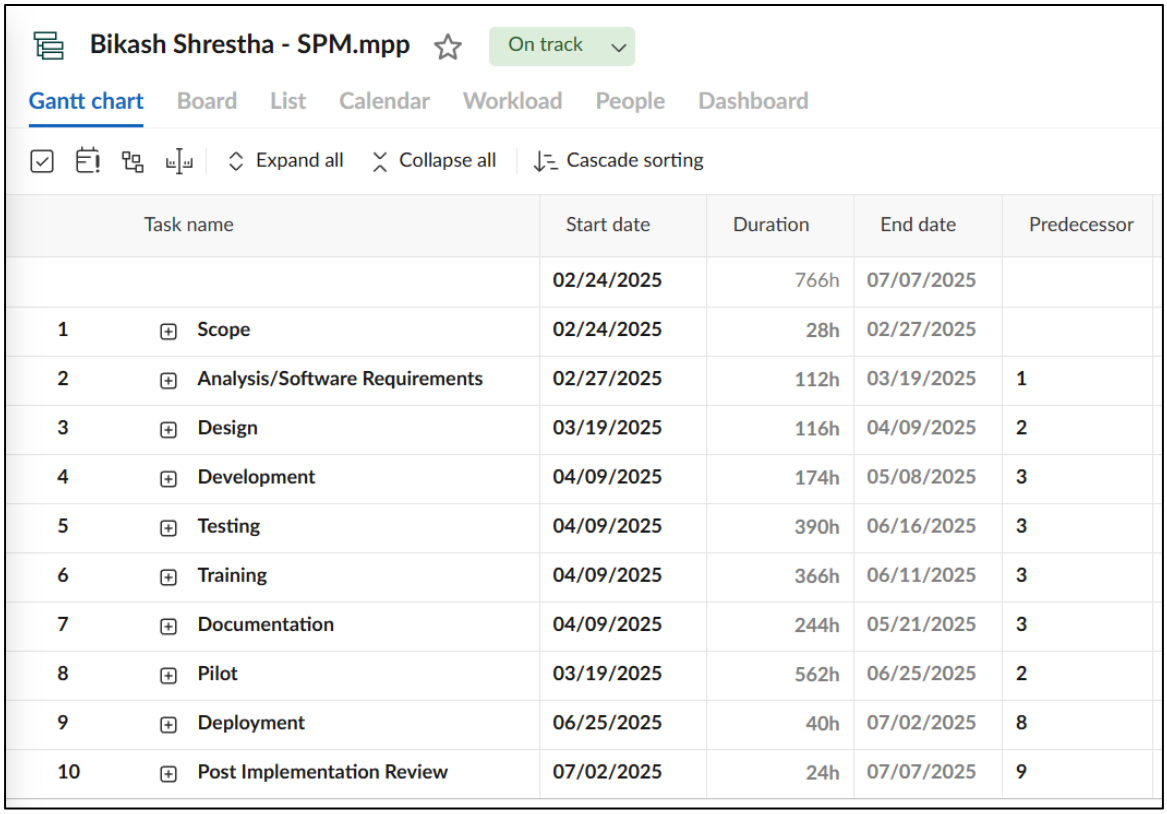
Figure 2. 5 Gantt Chart of the project by months

3. Critical Path Method and Precedence Diagram

Critical Path Method (CPM):

It is a project management technique used to identify the longest sequence of dependent tasks in a project, determining the shortest possible completion time. It helps optimize scheduling, resource allocation, and risk management.

The figure below is the project specification with estimated activity duration and precedence requirements:



	Task name	Start date	Duration	End date	Predecessor
		02/24/2025	766h	07/07/2025	
1	Scope	02/24/2025	28h	02/27/2025	
2	Analysis/Software Requirements	02/27/2025	112h	03/19/2025	1
3	Design	03/19/2025	116h	04/09/2025	2
4	Development	04/09/2025	174h	05/08/2025	3
5	Testing	04/09/2025	390h	06/16/2025	3
6	Training	04/09/2025	366h	06/11/2025	3
7	Documentation	04/09/2025	244h	05/21/2025	3
8	Pilot	03/19/2025	562h	06/25/2025	2
9	Deployment	06/25/2025	40h	07/02/2025	8
10	Post Implementation Review	07/02/2025	24h	07/07/2025	9

Figure 3. 1 Project specification

Precedence diagram:

It is a project management tool that visually represents tasks and their dependencies. It helps in scheduling, organizing workflows, and determining the sequence in which activities should be executed.

The figure below is the network diagram representing the project activities and their dependencies.

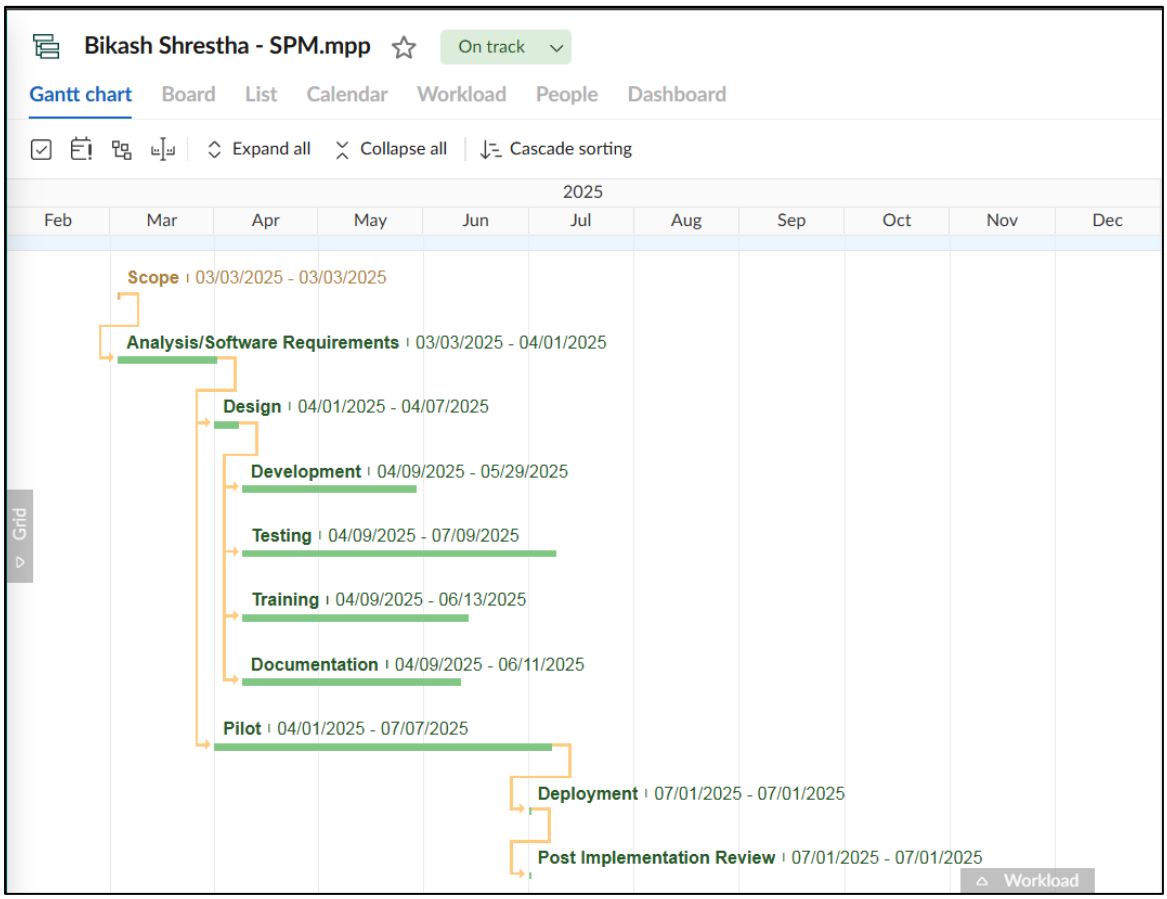


Figure 3. 2 Precedence Diagram

In this project any delay in activities 1, 2, 8, 9, 10 will directly impact the overall project duration.

Critical Path: 1 → 2 → 8 → 9 → 10

The critical activities are:

- Scope,
- Analysis/Software Requirements,
- Pilot,
- Deployment and
- Post Implementation Review

Estimated Project Duration: 766 hours or 31.92 days

4. Cost-Benefit Analysis in Excel

Cost-benefit analysis:

CBA is a financial decision-making method used to evaluate the pros and cons of a project, investment, or action. It involves comparing the expected costs and benefits to determine whether the initiative is worthwhile. The goal is to quantify both tangible and intangible factors, helping decision-makers assess feasibility and profitability.

Table 4.1 Cash flow forecasts

Year	Project 1	Project 2	Project 3	Project 4
0	Rs. (1,00,000.00)	Rs. (10,00,000.00)	Rs. (1,00,000.00)	Rs. (1,00,000.00)
1	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
2	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
3	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
4	Rs. 20,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
5	Rs. 1,00,000.00	Rs. 3,00,000.00	Rs. 30,000.00	Rs. 75,000.00

The table above is the cash flow forecasts for four projects. In each case it is assumed that the cash flows take place at the end of each year. Here values inside brackets represents expenditure and positive value represent income.

Net profit: It is a financial metric used to measure the profitability of a business or project. It calculates the difference between total revenue and total expenses, showing how much actual profit remains after all costs are deducted.

Formula: Net Profit = Total Revenue - Total Expenses

The figure below is cost benefit analysis based on net profit, it shows the Project 2 as cost beneficial.

Cost- Benefit Anaylsis - Net Profit

Year	Project 1	Project 2	Project 3	Project 4
0	Rs. (1,00,000.00)	Rs. (10,00,000.00)	Rs. (1,00,000.00)	Rs. (1,00,000.00)
1	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
2	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
3	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
4	Rs. 20,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
5	Rs. 1,00,000.00	Rs. 3,00,000.00	Rs. 30,000.00	Rs. 75,000.00
Net profit	Rs. 50,000.00	Rs. 1,00,000.00	Rs. 50,000.00	Rs. 95,000.00

Figure 4. 1 Cost Benefit Analysis based on Net Profit

Payback Period: It is a financial metric that calculates the time required for an investment or project to recover its initial cost through generated cash flows or savings. It helps assess how quickly an investment will break even.

Formula: Payback Period = Initial Investment \ Annual Cash Inflows

The figure below is cost benefit analysis based on payback period; it shows the Project 2 as cost beneficial.

Cost- Benefit Anaylsis - Payback Period				
Year	**Project 1**	**Project 2**	**Project 3**	**Project 4**
0	Rs. (1,00,000.00)	Rs. (10,00,000.00)	Rs. (1,00,000.00)	Rs. (1,00,000.00)
1	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
2	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
3	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
4	Rs. 20,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
5	Rs. 1,00,000.00	Rs. 3,00,000.00	Rs. 30,000.00	Rs. 75,000.00
Payback period (Yrs)	3.333333333	4.545454545	3.333333333	2.564102564

Figure 4. 2 Cost Benefit Analysis based on Payback Period

Return on Investment (ROI): It is a financial metric used to assess the profitability of an investment. It compares the gain or loss relative to the initial cost, helping businesses and individuals evaluate the efficiency of their investments.

Formula: ROI = (Average Annual Profit \ Initial Investment) * 100

The figure below is the cost benefit analysis based on ROI, it shows the Project 4 as cost beneficial.

Cost- Benefit Anaylsis - Return on Investment				
Year	**Project 1**	**Project 2**	**Project 3**	**Project 4**
0	Rs. (1,00,000.00)	Rs. (10,00,000.00)	Rs. (1,00,000.00)	Rs. (1,00,000.00)
1	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
2	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
3	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
4	Rs. 20,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
5	Rs. 1,00,000.00	Rs. 3,00,000.00	Rs. 30,000.00	Rs. 75,000.00
Net profit	Rs. 50,000.00	Rs. 1,00,000.00	Rs. 50,000.00	Rs. 95,000.00
Average Annual profit	Rs. 10,000.00	Rs. 20,000.00	Rs. 10,000.00	Rs. 19,000.00
ROI (%)	10	2	10	19

Figure 4. 3 Cost Benefit Analysis based on ROI

Net Present Value (NPV): It is a financial metric used to determine the profitability of an investment by assessing the difference between the present value of cash inflows and outflows over time. It accounts for the time value of money, ensuring that future cash flows are appropriately discounted.

Formula:

$$NPV = \sum_{t=0}^{n} \frac{R_t}{(1+i)^t}$$

Where:

- R_t = Net cash flow (inflows minus outflows) during a single period t
- i = Discount rate (the required rate of return or cost of capital)
- t = Number of time periods
- n = Total number of time periods

The figure below is the cost benefit analysis based on NPV, it shows the Project 4 as cost beneficial.

Cost- Benefit Anaylsis - Net Present Value

Year	Project 1	Project 2	Project 3	Project 4
0	Rs. (1,00,000.00)	Rs. (10,00,000.00)	Rs. (1,00,000.00)	Rs. (1,00,000.00)
1	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
2	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
3	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
4	Rs. 20,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
5	Rs. 1,00,000.00	Rs. 3,00,000.00	Rs. 30,000.00	Rs. 75,000.00
Net Present Value (8%)	Rs. 8,529.89	Rs. (1,33,399.67)	Rs. 19,781.30	Rs. 50,407.54
Net Present Value (10%)	Rs. 620.92	Rs. (1,79,750.51)	Rs. 13,723.60	Rs. 41,665.06

Figure 4. 4 Cost Benefit Analysis based on NPV

Internal Rate of Return (IRR): It is a financial metric used to evaluate the profitability of an investment. It represents the discount rate at which the Net Present Value (NPV) of all future cash flows equals zero. Essentially, IRR is the expected annual rate of return on an investment.

Formula:

$$0 = \sum_{t=0}^{n} \frac{R_t}{(1+IRR)^t}$$

Where:

- Rt = Net cash flow during period t
- IRR = Internal Rate of Return
- t = Number of time periods
- n = Total number of time periods

The figure below is the cost benefit analysis based on IRR, it shows the Project 4 as cost beneficial.

Cost- Benefit Anaylsis - Internal Rate of Return

Year	Project 1	Project 2	Project 3	Project 4
0	Rs. (1,00,000.00)	Rs. (10,00,000.00)	Rs. (1,00,000.00)	Rs. (1,00,000.00)
1	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
2	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
3	Rs. 10,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
4	Rs. 20,000.00	Rs. 2,00,000.00	Rs. 30,000.00	Rs. 30,000.00
5	Rs. 1,00,000.00	Rs. 3,00,000.00	Rs. 30,000.00	Rs. 75,000.00
IRR	10%	3%	15%	23%

Figure 4. 5 Cost Benefit Analysis based on IRR