



PROJECT EVALUATION METHODS

Overview of Different Project Evaluation Techniques.

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Importance of Project Evaluation Methods:

Project evaluation methods are systematic processes and techniques used to assess and measure the performance, success, and impact of a project.

- Effective Decision Making
- Risk Management
- Resource optimization

Project Evaluation

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graph TD; A[Project Evaluation] --> B[Traditional Approach]; A --> C[Modern Approach]; B --> D["• Payback Period Method<br>• Post Payback Method<br>• Return Rate of Investment"]; C --> E["• Net Present Value (NPV)<br>• Internal Rate of Return (IRR)<br>• Profitability Index (PI)"]
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The diagram is a hierarchical flowchart. At the top is a light blue rounded rectangle labeled 'Project Evaluation'. Two arrows point down from it to two more light blue rounded rectangles: 'Traditional Approach' on the left and 'Modern Approach' on the right. From 'Traditional Approach', an arrow points down to a larger light blue rounded rectangle containing a bulleted list of three methods. From 'Modern Approach', an arrow points down to a larger light blue rounded rectangle containing a bulleted list of three methods. The background is light gray with a decorative blue and black geometric shape on the left side.

Traditional Approach

- **Payback Period Method**
- **Post Payback Method**
- **Return Rate of Investment**

Modern Approach

- **Net Present Value (NPV)**
- **Internal Rate of Return (IRR)**
- **Profitability Index (PI)**



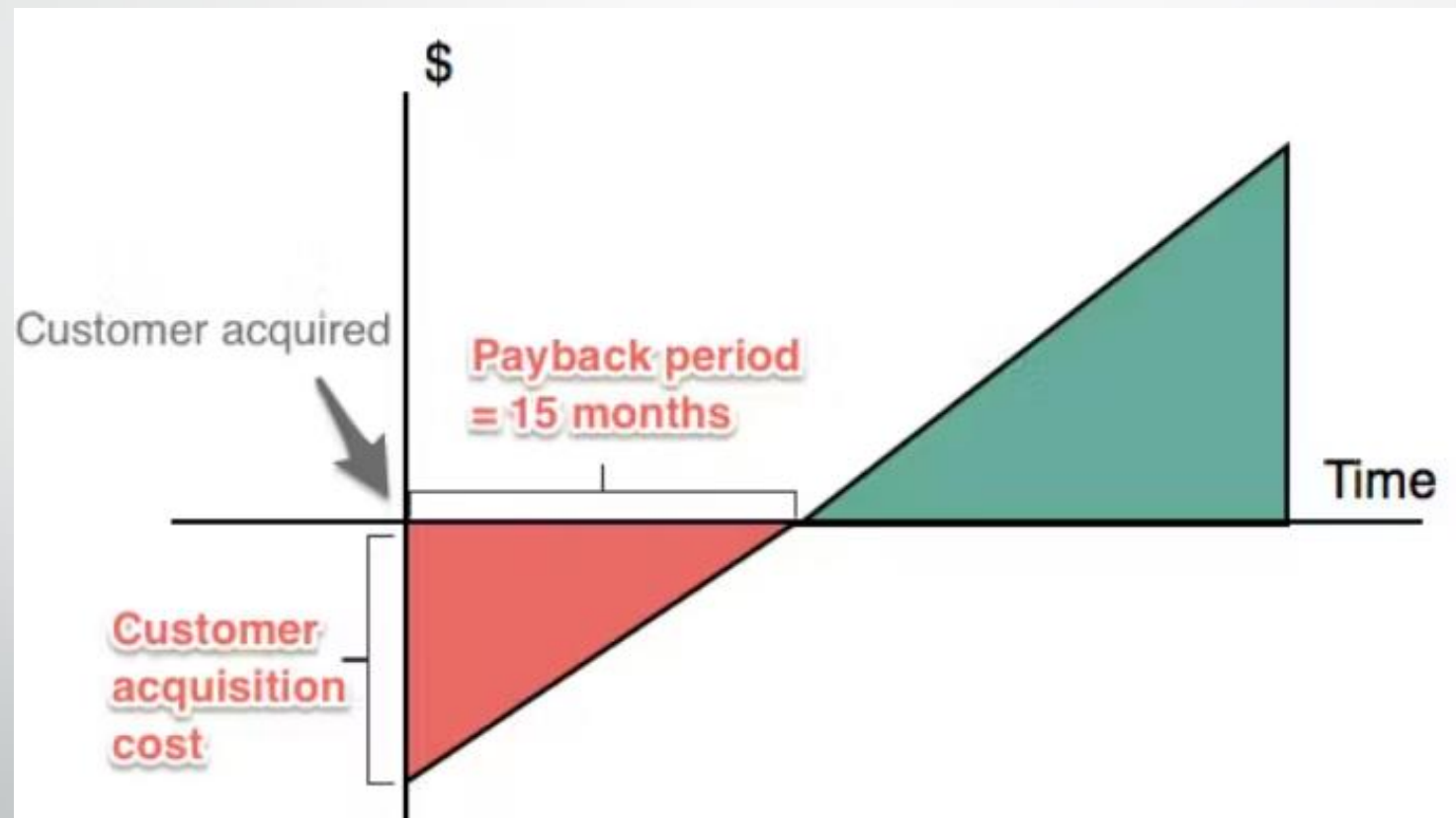
Traditional Approach.....

They focus on measuring a project's success primarily in terms of financial returns and compliance with predefined criteria

Payback Period Method:

- The payback period measures the length of time it takes for a project to recoup its initial investment. Shorter payback periods are preferred as they reduce risk.
- It is determined by summing up the project's cash flows until they reach a cumulative total of zero.
- $$\text{Payback Period} = \frac{\text{Initial Investment}}{\text{Annual Cash inflows}}$$
- **Accept/Reject Criteria:** If Payback Period is less than Life of project then project should be accepted otherwise reject.

Payback Period Graph



- A company invests \$30,000 in a project with expected annual cash inflows of \$10,000 for a project life of 5 years. What is the payback period for this project, and what does it indicate about the investment's return?
- $\text{Payback Period} = \$30,000 / \$10,000 \text{ per year}$
- $\text{Payback Period} = 3 \text{ years}$
- The payback period for this project is 3 years. This means that it will take 3 years to recover the initial investment of \$30,000 from the annual cash inflows of \$10,000.

Post Payback Method:

- The post payback period is similar to the payback period but also includes the time value of money.
- The Post Payback Method focuses on the period after the initial investment has been recovered.
- The project that gives the greatest post pay-back period may be accepted.

- In the previous example, we calculated the payback period to be 3 years. Now, let's find the cash flows after the payback period:
- Total Cash Inflows over 5 years = \$10,000 per year x 5 years = \$50,000
- Cumulative Cash Inflows during the payback period
$$= \$10,000 \times 3 \text{ years} = \$30,000$$
- Cash Flows After Payback Period = \$50,000 - \$30,000 = \$20,000
- So, the cash flows after the payback period amount to \$20,000.

Accounting Rate of Return(ARR)

- Estimating the average annual earnings to be generated by the project. And considered in accounting terms.
- $$ARR = \frac{\text{Average Accounting Profit}}{\text{Average Investment}} * 100$$
- $$\text{Average Accounting Profit} = \text{Average Investment} / \text{No of Years}$$
- $$\text{Average Investment} = (\text{Initial Investment} + \text{Residual Value}) / 2$$

Return Rate of Investment (RRI)



- The RRI is the ratio of the average net income per year to the initial investment. Higher RRIs indicate more profitable projects.
- It measures how well the investment made on a project.
- $$\text{RRI} = \frac{\text{Net Profit}}{\text{Total Investment}} * 100.$$

- $\text{ROI} = (\text{Net Profit} / \text{Initial Investment}) \times 100$
- $\text{Net Profit} = \text{Total Cash Inflows} - \text{Initial Investment}$
- $= \$50,000 - \$30,000 = \$20,000$
- Now, let's calculate the ROI:
- $\text{ROI} = (\$20,000 / \$30,000) \times 100$
- $= (2/3) \times 100$
- $= 66.67\%$

Modern Approach.....

- Modern project evaluation often involves sophisticated modeling and sensitivity analysis.

Net Present Value Methods:

- The NPV measures the difference between the present value of cash inflows and the present value of cash outflows. Positive NPVs indicate profitable projects.
- $$NPV = [C_1 / (1 + k)^1 + C_2 / (1 + k)^2 + \dots + C_n / (1 + k)^n] - C_0$$
- $$NPV = \sum [C_t / (1 + k)^t] - C_0$$
- Where , C_1, C_2, \dots, C_n Cashinflow
 C_0 Cashoutflow
- If the NPV is positive, it indicates that the project is expected to generate a return greater than the required rate of return (the discount rate). A positive NPV is considered an indicator of a financially viable project.



- The project costs 2,500 cash inflows 900,800,700,600 and 500 in years 1 to 5. Opportunity cost is 15% .Find Net present value .

- $$\text{NPV} = [900 / (1 + 0.15)^1 + 800(1 + 0.15)^2 + 700(1 + 0.15)^3 + 600(1 + 0.15)^4 + 500(1 + 0.15)^5 - 200]$$

- $$\text{NPV} = -60.51$$

Internal Rate of Return (IRR)

- IRR is a financial metric that calculates the discount rate at which the NPV of a project becomes zero. It represents the project's estimated rate of return and helps in comparing different investment opportunities.
- $0 = [C_1 / (1 + k)^1 + C_2 / (1 + k)^2 + \dots + C_n / (1 + k)^n] - C_0$
- $\Sigma [C_t / (1 + k)^t] = C_0$
- Where , C_1, C_2, \dots, C_n Cashinflow
 C_0 Cashoutflow
- The IRR is compared to the required rate of return. If the IRR is greater than the required rate of return, the project is considered acceptable. The higher the IRR, the more financially attractive the project.

- If you invest \$200 today and expect to receive three yearly payments of \$100 each, followed by a lump sum of \$2,500 in three years, what is the internal rate of interest (IRR) that equates the present value of these cash flows to the initial investment?
- Lets try for 10% interest Rate,
- $$NPV = [100 / (1 + 0.10)^1 + 100 / (1 + 0.10)^2 + 100 / (1 + 0.10)^3 + 2500 / (1 + 0.15)^4] - 2000$$

$$NPV = 126.97$$
- Lets try for 12% ,

$$NPV = 19.64$$
- At last 12.4 % we will get NPV as 0. Hence IRR is 12.4 %

Profitability Index:

- The profitability index (PI), also known as the benefit-cost ratio, measures the profitability of a project relative to its initial investment.
- $$PI = \frac{PV \text{ Cashflows}}{PV \text{ CashOutFlow} | \text{Initial Investment}}$$
- A Profitability Index greater than 1 indicates that the project is accepted otherwise rejected. The higher the PI, the more financially attractive the project.

A company invests in a project. The expected annual cash flows are as follows with discount rate 10%.

Year 0 : ₹-15,00,000

Year 1: ₹1,50,000

Year 2: ₹3,00,000

Year 3: ₹5,00,000

Year 4: ₹2,00,000

Year 5: ₹6,00,000

Year 6: ₹5,00,000

Year 7: ₹1,00,000

Year	Amount	PV
0	-1,500,000	
1	150,000	136,363.64
2	300,000	247,933.88
3	500,000	375,657.40
4	200,000	136,602.69
5	600,000	372,552.79
6	500,000	282,236.97
7	100,000	51,315.81

PV
PI

1,602,663.18
1.06

Criteria for Selecting Project Evaluation Methods

- Project scope - complexity, size, and type of project
- Resource availability - budget, personnel, equipment, and technology
- Time constraints - deadlines, project duration, and scheduling
- Decision-making process - involvement of stakeholders, authority, and risk appetite



Thank You.....!!