Cost-Benefit Evaluation in SPM

🔹 **Definition**

In **Software Project Management (SPM)**, **Cost-Benefit Evaluation** is part of the **feasibility study** .It compares the **estimated costs of developing and maintaining a software project** with the **expected benefits** (financial, operational, and organizational) that the software will provide.

It helps managers decide whether the software project is **worth pursuing**, and which alternative solution is **most cost-effective**.

🔹 **Steps in Cost-Benefit Evaluation**

1. **Identify the system objectives**
    - What problem does the software solve?
    - What goals should it achieve?
2. **Identify alternative solutions**
    - In-house development, outsourcing, or off-the-shelf software.
3. **List the Costs**
    - **Development Costs**: salaries, hardware, software, tools.
    - **Operating Costs**: maintenance, upgrades, support, training.
    - **Indirect Costs**: downtime, risks, integration challenges.
4. **List the Benefits**
    - **Tangible**: reduced manual work, improved efficiency, increased revenue, cost savings.
    - **Intangible**: user satisfaction, improved decision-making, brand reputation.
5. **Quantify Costs and Benefits**
    - Assign monetary values where possible.
6. **Compare Costs vs. Benefits** using:
    - **Net Benefit = Benefits – Costs**
    - **Benefit-Cost Ratio (BCR) = Benefits ÷ Costs**
    - **Return on Investment (ROI) = (Net Benefits ÷ Costs) × 100%**

- **Payback Period = Time required to recover project costs**

7. **Decision Making**
   - If benefits outweigh costs (BCR > 1 or ROI is positive), project is feasible.
   - Else, modify or reject the project.

🔹 **Example in SPM**

Suppose a company plans a new software system:

- **Estimated Costs**: ₹40,00,000 (development, training, maintenance).
- **Expected Benefits**: ₹70,00,000 (savings + revenue increase).

Calculations:

- **Net Benefit = 70,00,000 – 40,00,000 = ₹30,00,000**
- **BCR = 70,00,000 ÷ 40,00,000 = 1.75 (>1, so feasible)**
- **ROI = (30,00,000 ÷ 40,00,000) × 100 = 75%**

✅ The project is financially viable and should be accepted.

🔹 **Why Important in SPM?**

- Helps avoid **loss-making projects**.
- Ensures **resources are allocated effectively**.
- Provides **justification** to management and stakeholders.
- Supports **risk reduction** by evaluating alternatives before committing.

Risk Identification in Software Project Management

🔹 **Definition**

Risk Identification is the process of **recognizing, listing, and describing potential risks** that may affect a software project's success.
It is the **first step in risk management**

The goal is to **anticipate risks early** so they can be analyzed and controlled before causing damage.

🔹 **Characteristics of Risk Identification**

- Proactive, not reactive.
- Conducted throughout the project life cycle.
- Involves **project managers, developers, stakeholders, and customers**.
- Risks are described in clear, measurable terms (cause → effect → impact).

🔹 **Methods of Risk Identification**

1. **Checklists** – Using pre-prepared lists of common risks in software projects.
2. **Interviews/Questionnaires** – Collecting insights from experts and stakeholders.
3. **SWOT Analysis** – Identifying risks from project **Strengths, Weaknesses, Opportunities, and Threats**.
4. **Past Project Experience** – Learning from similar projects' issues.
5. **Delphi Technique** – Anonymous feedback from experts until consensus is reached.

🔹 **Types of Risks in SPM**

Risk identification usually classifies risks into categories:

1. **Project Risks**
    - Poor cost estimation
    - Unrealistic schedules
    - Scope creep (requirement changes)
    - Resource shortages
2. **Technical Risks**
    - Use of new/unfamiliar technology
    - Integration failures
    - Inadequate testing
    - Performance issues
3. **Business Risks**
    - Project not aligned with business goals

- Market changes
- Budget cuts
- Return on investment uncertainty

4. **Organizational Risks**
    - Management changes
    - Lack of support from stakeholders
    - Poor communication
5. **External Risks**
    - Regulatory/legal changes
    - Vendor failures
    - Natural disasters or geopolitical issues

🔹 **Risk Identification Process**

1. **Understand project objectives & scope**.
2. **Collect information** from team, customers, past projects.
3. **List potential risk events**.
4. **Classify risks** into categories (technical, managerial, business, etc.).
5. **Document risks** in a **Risk Register** with:
    - Risk description
    - Cause of risk
    - Potential impact
    - Probability (High/Medium/Low)

🔹 **Example – Risk Identification in a Software Project**

Suppose a company is developing an **online banking system**:

Risk	Cause	Impact
Resource shortage	Key developer leaving	Productivity loss

Risk	Cause	Impact
Market shift	New competitor app	Reduced ROI

- **Why Risk Identification is Important in SPM?**
  - Prevents surprises and project failures.
  - Improves **planning and scheduling**.
  - Helps in **cost control**.
  - Ensures better **stakeholder confidence**.
  - Provides input for **risk analysis and mitigation strategies**.