Risk Evaluation

➢ Risk is associated with almost every project. Risk can become an important factor when the project is not able to meet its objectives.

➢ Every possible risk must be identified, analyzed and minimized during the development of the software system.

Risk Identification

➢ Every project evaluation involves risk handling issues.

➢ All possible risks are identified and must be quantified with their potential measures of evaluation.

➢ A project risk matrix can be implemented in creating a checklist of all possible risks and classify them based on their relative importance.

➢ The risk matrix contains values of high, medium and low based on their likelihood.

➢ Some factors classified in the risk project matrix contains, delivery of software, development budget exceeded limit, estimation of maintenance costs, response time targets and so on.

Risk Ranking

➢ Based on the risk identified, ranking can be established for projects.

➢ Evaluating projects based on the risk project matrix gives a clear picture of how to rank the different risks that occurs in projects.

➢ Risk ranking involves giving scores to projects based on priorities defined for each risk in the project.

NPV and Risk

➢ Risky projects always have a higher discount rate for the net present value calculation.

➢ The risk level may be very high for a specific project due to rise in NPV value. So based on risk scores, projects are classified as high, medium and low level.

➢ It is better to have an additional risk premium factor to have an consistent method in developing the project.

➢ Discounted cash flow techniques can be used to evaluate the net present value of future cash flow taken into account the interest rates and uncertainty.

Risk in Cost benefit analysis

- Cost-benefit analysis focuses on the estimated cost defined for the project compared with the actual costs incurred in the development process.

- Evaluation of risk involves the possible outcomes of the project by estimating the probability of occurring.

- A group of cash flow forecasts associated with each probability of occurring can be defined and the value summarizes the cost or benefit of each possible outcome weighted with its relative probability.

- Basically, cost-benefit analysis is done for evaluation of larger projects which are subject to uncertainty.

- It is most appropriate to evaluate a portfolio of projects to determine the overall profitability.

Risk Profile Analysis

- Risk profiles are constructed using sensitivity analysis which involves the sensitivity factors that affect the project costs or benefits.

- For example, the original estimate of a project was calculated with plus or minus 5% of risk, then calculating the expected costs and benefits for each of the estimating factor results in evaluating the sensitivity of the project.

- Sensitivity analysis identifies the factors that yields a success to the project and decide about whether to carry on with the project or lay off.

- The sensitivity analysis takes into account every risk factor, and evaluates on the possible chances of a particular outcome of the project.

- Monte Carlo simulation tool is used to find out the number of possible chances of specific project.

- A sample risk analysis profile is depicted in the figure below:

- Consider three projects 1, 2 and 3, the figure describes that project 1 is very far from the expected value compared to project 2. Project 2 exhibits a larger variance where as project 3 represent a skewed distribution. Project 3 can attain the profitability than expected but it can go worse too.
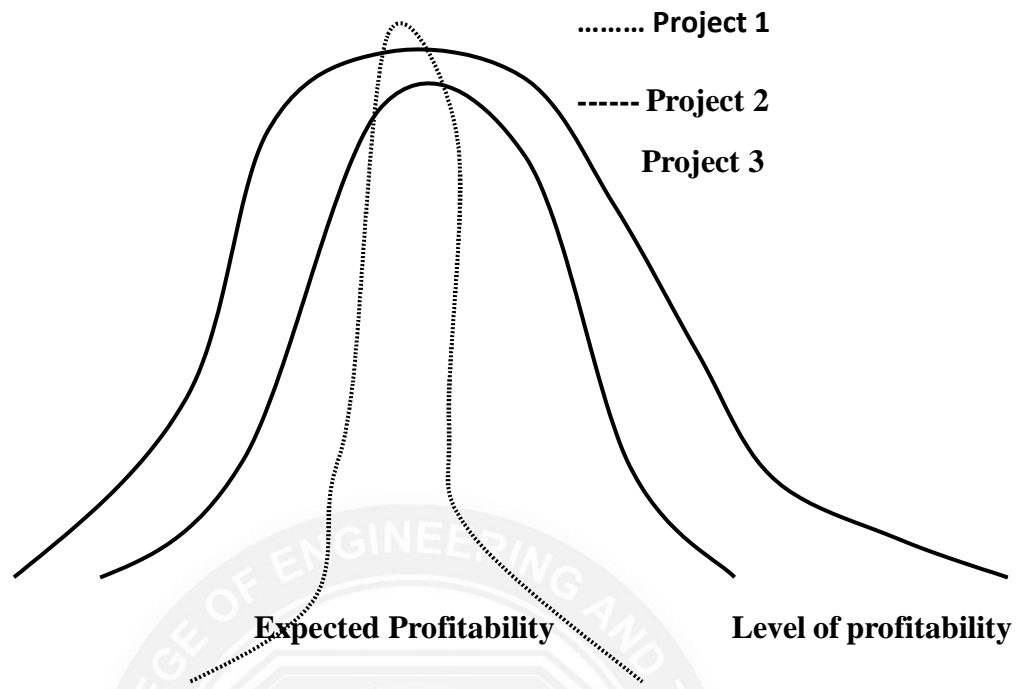
A Risk Profile Analysis

Risk handling using Decision trees

> ➤ It is better to reject projects than working with risky ones.
> ➤ Decision trees is a tool which provides evaluation of project's expected outcomes and choosing between the alternative strategies.

Any decision that is made will have a greater impact on the future profitability of the project.

> ➤ The analysis of a decision tree consists of evaluating the expected benefit of takingeach path from a decision point.
> ➤ The expected value of each path is determined by the sum of the value of eachpossible outcome multiplied by its probability of occurrence.
> ➤ The figure illustrates the use of decision tree of when to extend the project or replacethe existing system based on the NPV values defined.
> ➤ Decision tress are more advantageous because it will give a precise idea of modelingand analyzing the problems in the project.