

SOFTWARE ENGINEERING

Risk Management

Risk management is an attempt to minimize the chances of failure caused by unplanned events. The aim of risk management is not to avoid getting into projects that have risks but to minimize the impact of risks in the projects that are undertaken.

A risk is a probabilistic event—it may or may not occur.

Risk Management is considered first among the best practices for managing large software projects.

Risk Management Concepts

Risk is defined as an exposure to the chance of injury or loss. That is, risk implies that there is a possibility that something negative may happen.

In the context of software projects, negative implies that there is an adverse effect on cost, quality, or schedule. Risk management is the area that tries to ensure that the impact of risks on cost, quality, and schedule is minimal.

Risk management can be considered as dealing with the possibility and actual occurrence of those events that are not “regular” or commonly expected, but they are probabilistic. It deals with events that are infrequent, somewhat out of the control of the project management, and which can have a major impact on the project.

The idea of risk management is to minimize the possibility of risks materializing, if possible, or to minimize the effects if risks actually materialize.

Risk management has to deal with identifying the undesirable events that can occur, the probability of their occurring, and the loss if an undesirable event does occur.

Examples:

- In a project there could be an expected risk, such as people going on leave or some requirements change. These are handled by normal project management. So, in a sense, risk management begins where normal project management ends.
- When constructing a building, there is a risk that the building may later collapse due to an earthquake. That is, the possibility of an earthquake is a risk. If the building is a large residential complex, then the potential cost in case the earthquake risk materializes can be enormous. This risk can be reduced by shifting to a zone that is not earthquake-prone.

Risk Assessment

The goal of risk assessment is to prioritize the risks so that attention and resources can be focused on the more risky items. Risk identification is the first step in risk assessment, which identifies all the different risks for a particular project. These risks are project-dependent and identifying them is an exercise in envisioning what can go wrong. Methods that can aid risk identification include checklists of possible risks, surveys, meetings and brainstorming, and reviews of plans, processes, and work products.

List of the top 5 risk items likely to compromise the success of a software project.

	Risk Item	Risk Management Techniques
1	Personnel Shortfalls	Staffing with top talent; Job matching; Team building; Key personnel agreements; Training; Prescheduling key people
2	Unrealistic Schedules and Budgets	Detailed cost and schedule estimation; Design to cost; Incremental development; Software reuse; Requirements scrubbing
3	Developing the Wrong Software Functions	Organization analysis; Machine analysis; User surveys; Prototyping; Early user's manuals
4	Developing the Wrong User Interface	Prototyping; Scenarios; Task analysis; User characterization
5	Gold Plating	Requirements scrubbing; Prototyping; Cost benefit analysis; Design to cost

Risk Control

- The main objective of risk control is to identify the top few risk items and then focus on them.
- Once the risks have been identified and prioritized the risks, the top risks can be easily identified.
- Knowing the risks is of value to prepare a plan to counter their impact.
- One obvious strategy is risk avoidance, which entails taking actions that will avoid the risk altogether.
- For most risks, the strategy is to perform the actions that will either reduce the probability of the risk materializing or reduce the loss due to the risk materializing.
- Risk Control comprises of active measures that have to be performed to minimize the impact of risks.

- Risk prioritization and control are based on the risk perception at the time the risk analysis is performed.
- One simple approach for risk monitoring is to analyze the risks afresh at each major milestone, and change the plans as needed.