RESEARCH ARTICLE

Software Risk Management

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Abstract- Risk management is very important topic because the history of software development projects is full of major or minor failures. Many projects run over budget or behind the schedule. It is an important area for consideration especially for large projects. This paper presents a detailed road map of the risk-based methodologies for Software Risk Management. These methodologies address the entire life cycle of software from requirement specifications to development, and maintenance. This paper is concerned about the assessment of risk and ways to manage these risks.

Keywords- Risk Management, Budget, Project, Activity, Assessment

I. INTRODUCTION

Risk management is the identification, assessment, and prioritization of risks followed by coordinated and economical application of resources to minimize, monitor, and control the probability and impact of unfortunate events. Risk management's objective is to assure uncertainty does not affect the project. [1] Many large projects involve risks, and that is also true in case of software projects. Risk management tries to address the problem of identifying and managing the risk associated with a software project. Risk in a project is the possibility that the defined goals are not met. The aim of the risk management is to avoid disaster or heavy losses [2]. Making informed decisions by consciously assessing what can go wrong, as well as the likelihood and severity of the impact. Making informed decisions involves the evaluation of the trade-offs associated with all policy options for risk mitigation in terms of their costs, benefits, and risks, and the evaluation of the impact of current decisions on future options. This process of risk management embodies the identification, analysis, planning, tracking, controlling, and communication of risk. [3]

II.   RISK ASSESSMENT

During the project planning one of the important activity is risk assessment. This involves identifying the risks, analyzing them and prioritizing them on the basis of analysis. Software risks can be classified into three categories:-

- Cost Risk
- Performance Risk
- Schedule Risk

Cost risk is the degree of uncertainty associated with the budgets of the project. Performance risk is the uncertainty that the system will be unable to deliver all or some of the benefits fixed earlier for the project. There is possibility that it may or may not deliver according to the requirements. Schedule risk is the degree of uncertainty associated with the project schedule or the ability of the project to achieve specified criterion.

Boehm [4] has produced a list of the top 10 risk items likely to compromise the success of a software project. Table 1 shows some of these risks along with the techniques preferred by management for managing these risks.

TABLE 1

	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

Sometimes it is not possible to use models and prototypes to assess the probabilities of occurrence and of loss associated with particular events.

III. RISK CONTROL

Risk assessment is a passive activity which tries to assess the risks and their impacts whereas risk control comprises active measures that are taken by project management to minimize the impact or risks.

Risk control starts with risk management planning. The main objective of risk management is to identify the top few risk items and then focus on them. Once a project manager has identified and prioritized the risks, the top risks can be easily identified. Plans are developed for each risk that needs to be controlled. Many risks can be combined together for the purpose of planning [2].

One obvious strategy is risk avoidance, which entails taking actions that will avoid the risk altogether. For some risks, avoidance might be possible but not for all. 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. These are called risk mitigation steps. Unlike risk assessment, which is largely an analytical exercise, risk mitigation comprises active measures that have to be performed to minimize the impact of risks. In other words, selecting a risk mitigation step is not just an intellectual exercise. The risk mitigation step must be executed. To ensure that the needed actions are executed properly, they must be incorporated into the detailed project schedule.

Risk prioritization and consequent planning are based on the risk perception at the time the risk analysis is performed. Because risks are probabilistic events that frequently depend on external factors, the threat due to risks may change with time as factors change. Clearly, then, the risk perception may also change with time. Furthermore, the risk mitigation steps undertaken may affect the risk perception.

This dynamism implies that risks in a project should not be treated as static and must be monitored and reevaluated periodically. Hence, in addition to monitoring the progress of the planned risk mitigation steps, a project must periodically revisit the risk perception and modify the risk mitigation plans, if needed. Risk monitoring is the activity of monitoring the status of various risks and their control activities. One simple approach for risk monitoring is to analyze the risks afresh at each major milestone, and change the plans as needed.

IV. CONCLUSION

The proper risk plan is very important activity for a successful project. No project can succeed without proper planning. Risk analysis is very important aspect for big projects and its gaining importance due increasing applications of computer system in the complex environment. Risk is the possibility of loss due the failure of the project. Risk management helps to find risks involved and developing plan to avoid them.

REFERENCES

[1] https://en.wikipedia.org/wiki/Risk_management

[2] Pankaj Jalote, "An Integrated Approach to Software Engineering", Second Edition.

[3] Ronald P. Higuera,Yacov Y. Haimes, "Software Risk Management" Technical Report,CMU/SEI-96-TR-012 ,June 1996

[4] Barry W Boehm, "Software Risk Management: Principles and Practices"