Risk Analysis and Management—
A Framework

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Abstract

Risk is an event that can impact on the income and/or reputation of an organisation. In project situation, which has primarily futuristic connotations, managing risk through analysis, identification, measurement and monitoring for mitigation are significant steps. A project is defined as an effort wherein financial, material and manpower resources are brought together in an organised way to accomplish a unique scope of work within the given constraints of cost and time for attaining a beneficial change. The objectives may be qualitative or quantitative or both. Project risk relates to uncertain events or situations that potentially can adversely affect a project as planned, usually in terms of cost, schedule, and/or product quality. Risk is a function of event, probability and possible damage.

The paper would provide a conceptual framework on causes of risk situations, process of management of risk and means to minimise the occurrence of risk situations. The paper would discuss typical risk events in a project life cycle. The endeavour is to share the learning from real life experience of an unsuccessful technology implementation project in an Indian bank.

Introduction

KPMG Survey of Project Management 2002-2003 provides four causes for project failures, and they are unclear/changing scope requirements, poor project management, poor resources management and poor cost management. 59 percent of the surveyed organisations faced at least one failure during the year. Average cost of each failure was over USD 10 million. The massively ambitious and complex project cannot be alone be the reason for failure. There are a variety of reasons for project failures,

- Customer not knowing what he actually wants
- Poor understanding about software and software industry
- Competitive and aggressive vendors
- Ill defined specialisation and ever-changing offerings
- Poor documentation—more legal than substantive
- Dispersed and poorly defined roles and responsibilities
- Managerial arrogance at the customer level —disregard to user
- Complexities and expectation about integration
- Committees as the death nails

The core of the reasons is primarily relating to the project visualisation, assessing attendant risks and managing them in a systematic manner. This paper endeavours to put in place a conceptual framework with reference though the following sections,

1. The Concepts
2. Emergence of risky situations
3. Project Risk Management process
4. Framework for Risk Management
5. Risks in Risk Management

The Concepts

The terms used are risk, project, project risk, project management and risk management. They are described below,

Risk: Risk is an event that can cause damage to the income and/or reputation of an organisation. Risk is unavoidable, as there is direct relationship between return and risk. Risk is the potential for realisation of unwanted negative consequences of an event. It is the measure of the probability and severity of adverse effects. The risk involved may be either inherent, or acquired or contextual. Inherent risk relates to project objectives. Having a great ambition without proper preparations makes the project risky *ab initio*. The acquired risk concerns with the organisation, approach, methods, tools, techniques, skills, experience, etc. The contextual risk arises on account of certain events, circumstances; inter relationships, outside impact, etc. The risk of any kind eventually impinges on financial position of the organisation. There are three ways of looking at risk, quantitative, socially constructed and qualitative. Mathematical and statistical calculations like Monte Carlo Method can be used in deterministic decision making. Socially constructed risk depends upon the people's perception of risk, which is quite different from the mathematical/statistical calculation. Qualitative risk is a compromise between the quantitative and social schools.

Project: A project is a planned undertaking or organised set of services designed to achieve specific outcomes that begin and end within a specific pre-determined period. The concept of 'project' means different things to different users, or reflects different frames of reference. In finance and budgeting terms, it is an investment with a specified economic return. In economic analysis, a project is a potential income generating activity. In management terms, the project notion often connotes a particular organisational unit. A project is a complex assignment requiring varied competencies, usually inter-disciplinary and significant learning initiative. A project has a specific begin date and end date, specific objectives and specific resources detailed to perform the work. A project manager has overall responsibility and authority over a project. When the objectives are met, the project is considered complete.

Project Management: Project management is the systematic planning, organising and controlling of allocated resources to accomplish project cost, time and performance objectives. Project management is normally reserved for focused, non-repetitive, time-limited activities with some degree of risk and that are beyond the usual scope of programme (operational) activities for which the organisation is responsible. The application of knowledge, skills, tools and techniques to a broad range of activities to meet the requirements of the particular project is the key. Project management knowledge and practices are best described in terms of their component processes. These processes can be placed into five process groups (initiating, planning, executing, controlling and closing) and nine knowledge areas (project integration management, project scope management, project time management, project cost management, project quality management, project human resource management, project communications management, project risk management and project procurement management).

Project Risk: Project risk relates uncertain events or situations that potentially can adversely affect a project as planned, usually in terms of cost, schedule, and/or product quality. Project risk is a function of two components: likelihood and consequence.

Risk management: Risk Management describes the processes concerned with identifying, analyzing and responding to project risk. It consists of risk identification, risk analysis, risk evaluation and risk treatment. The processes are iterative throughout the life of the project and are built into the project management activities. Risk Management is conducted initially as part of the assessment of the project's viability and documented in the business case depending on the size of the project. This occurs during the initiation Phase of the project. It is also conducted throughout the project to ensure that changing circumstances are tracked and managed.

Emergence of risky situations

In any project, there are events at each stage of project life cycle that lead to a risk situation. They include,

1. At the initial stage, risk is the prerogative for discussions at the highest level. The focus is on the project implementation because through announcements and pronouncement, the project has already acquired a tremendous prestige. The people involved in the project and the people outside are bent upon making political capital or otherwise of the project success. The concerns are expressed at the top most level as a matter of wisdom.
2. The next stage is about considering the project beyond in-house capabilities for implementation. The issues are discussed in the context of lack of internal capabilities as the reason impeding success. The counter to this is brushing away these concerns as obstructionism in making the project successful.
3. Project management decisions are taken in the midst of the implementation. Such decisions, at times push the project from high risk to impossible. Decisions involve reducing time scale or sudden downsizing of budget or choosing an immature magic bullet to achieve early results.
4. There comes a time when the apparent failure of the project is seen. It is in everyone's knowledge that the project is having rough weather. Those who show the courage to discuss these issues are seen and branded as sabotage creators and are treated with hostility or even disdain. The result is firing the messenger as a troublemaker!
5. Notwithstanding the best efforts, the reality of eminent project failure cannot be denied. The search for a scapegoat begins, as also some one is needed to rescue the situation. Normally, the people on the project are relieved and an uninvolved person is brought in the midst of critical path. The so-called uninvolved person is generally a faultfinder and more often than not focuses on who did what and how he went wrong. Very rarely, the project is brought on the right path.
6. The project fails and some one or at the least technology is singled out for blame. The project initiation, appraisal, monitoring and other issues are disregarded and the project is buried.

There are many sources that give rise to the risky situations and they are,

- **Human resources-** Project teams are manned by human beings that are obviously not devoid of making errors. Well-conceived decisions based on full information also cause unintended outcomes. Not all the errors and mistakes can be anticipated at the time of project commencement. The impact is however on the project implementation.
- **Operations:** The running of any project is concurrent with the on-going operations. It never happens that all routine operations are given a halt or go-by for implementing the project. The difficulties in the existing operations create issues bringing the project to disarray. The risk analysis done for the project seldom considers the likely problems in the existing operations.
- **Reputational-** Every member of top management looks upon the undertaken project as a matter of both, institutional and personal reputation. While one way, this approach is good as far as commitment of the top management to the project is concerned, in another way, it acts as hindrance. In the process of maintaining reputation, ground realities of project implementation are ignored.
- **Procedures-**In the process of documenting the progress of the project in an adequate manner, the procedures override the performance. More time is spent on finalising the minutes of the meetings than creating performance to discuss and review in the meetings. The procedures are no doubt important but not at the cost of the project itself and this issue is lost site of.
- **Financial-** The project is budgeted properly and arrangements are made for the funding of the project from financial perspective. Financial forecasts at times do go wrong resulting in the paucity of funds for the project. The reduction of budget becomes the inevitable choice, thereby causing a risk situation in the project implementation.
- **Technological**- The project assumes certain level of technology support. The vendor promises deliveries that get either delayed or postponed even because of justifiable reasons. Without the technology component the project cannot move on. When the project is for technology up-gradation or implementation, the delays do and can even stop the implementation totally.
- **Natural-** Natural calamities or disasters cause stoppage in the project. These are neither forecastable nor controllable. Tsunami like happenings or floods can cause a risk of abandoning or postponing any on-going project as well.

It is recognised that all risk situations are neither avoidable nor controllable. What can be visualised has to be visualised through a risk management exercise. The primary reason for project failure is uncertainty The ground level reasons for a project facing risks or getting into troubled waters are many and include failure to,

- understand who the project is for
- appoint an executive user responsible for sponsoring the project
- appoint a fully qualified and resourceful project manager
- define the objectives of the project
- secure commitments from people who are needed to assist with the project
- estimate costs accurately
- specify very precisely the end users' requirements
- provide a good working environment for the project
- tie in all the people involved in the project with contracts

Project Risk Management process

Project risk management seeks to anticipate and address to uncertainties that threaten the goals and timetables of a project. As discussed earlier, the uncertainties may include questions of material and parts quality; delays in delivery of sufficient materials to meet project needs; budgetary and personnel changes; and, incomplete knowledge or research. These risks lead rapidly to delays in delivery dates and budget coverage that can severely undermine confidence in the project and in the project manager. Since project risk management is process oriented, it is a possibility to have a successful project and an unsuccessful product While any project accepts a certain level of risk, regular and rigorous risk analysis and risk management techniques serve to defuse problems before they arise. It was John F. Kennedy, who had said, "There are risks and costs to a programme of action but they are far less than the long range risks and costs of comfortable inaction." The process is flow charted below,
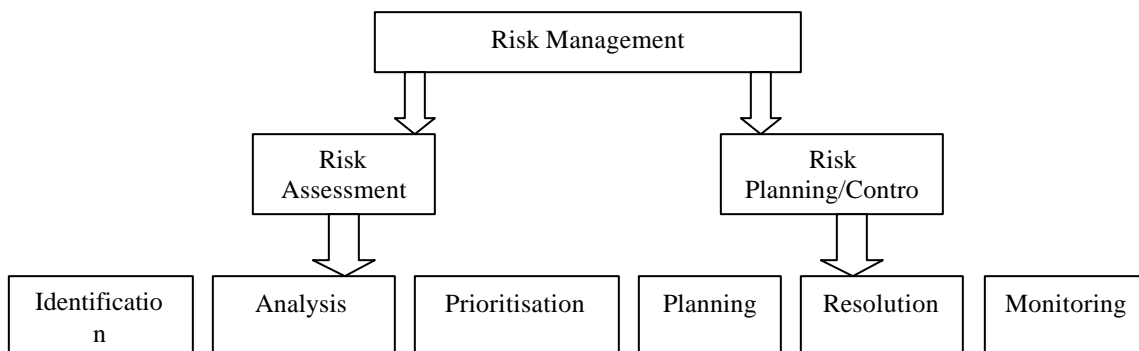
These have been discussed in this section,

Risk Analysis

Risk analysis is the process of identifying and evaluating risk factors, present or anticipated, and determining both the probability and the impact of identified risk factors. Risk analysis is a preliminary step in establishing a risk management strategy, which is intended to increase the possibility that the application development project produces the desired outcome while minimising risk factors. It entails both preventive and corrective actions to each of the identified risk factors, particularly those with a medium to high rating level. The analysis involves preparation of risk events in the following format,

Risk events	Probability of Occurrence			Magnitude of Impact			Risk Response
	Medium	High	Low	Medium	High	No Action	Type of Action

The risk events, illustratively for a technology related project have been listed below,

Risk factors/events	Risk factors/events
• Integration with Current Information Resource (IR) Strategies	• Project Timeline
• Customers IR Experience	• Change Control Management
• Customers Work Methods	• Development Methodology
• Customers Standard Business Procedures	• Experience of Staff
• Higher Management Project Support	• Consultant Personnel Mix
• Middle Management Project Support	• Available Personnel Resources
• Managerial Staffing and Stability	• Expertise with Hardware
• Project Management's Experience, if any with Similar Projects	• Experience with Software
• Expected Effect of System on Customer Service	• Technical Training of Staff
• Customers Definition of Project Requirements and Scope	• Complexity of Requirements
• Funding Sources	• Fit with Customer' s existing IR infrastructure
• Budget Size	• Quality/Timeline Control
• End User Perceived Benefits	• Open Systems
• End User Training Requirements	• Vendor Support
• End User Acceptance	• Maturity of Solution
• End User Experience, if any on Similar Projects	• Security
• Involvement of End Users with System Design and Testing	• Multiple Vendors/ Major Contractors
• Project Leader Experience	• System Integration/ Interfaces

The process of risk assessment is not a one time exercise but continues throughout the project cycle as any risk may and can crop up any time. Based on the intensity of the impact of the risk as high, medium and low, the prioritisation of risk is done.

Risk Planning/Control

Risk planning and control, as a shared or centralized activity must accomplish the following tasks:

- Identity concerns that can be impact the project implementation

- Identify risks, review/assess their intensity and document the risk owners

- Evaluate the risks with reference to probability of their occurrence and possible consequences

- Assess the plausible options for accommodating the recognised risks

- Prioritise the efforts required for managing the risks

- Develop/discuss and adopt risk management plans

- Authorise the implementation of the risk management plans

- Monitor the risk management efforts and

- Initiate the remedial actions as considered necessary

The primary considerations in the risk planning/control process are,

- It is necessary to clarify and arrive at a consensus about the expected outcome and anticipated results from the project. The project may concern only one department or division but the entire organisation is likely to benefit from the project implementation. In case of technology projects in particular, it is the business units are the major beneficiaries. Looking at the project, as an IT (Information Technology) project is a mistake committed by many people and organisations There has to an implicit understanding about the likely benefits and outcome the project would be providing at the conclusion.

- As stated above, the project is seen as IT project. The IT people are concerned with the project implementation and thereafter handing over the same to the business group. The involvement and commitment of all and in particular these two groups is the key. Moreover, the ownership of project by business right from the planning stage can be a safe assurance for well running and implementation of the project and eventually reaping business benefits

- Right from the project conception stage, what is needed is to put in place the project governance framework and administrative support requirement/provision. More often than not, the project people have to spend more time and energies to acquire the resources—financial, physical and manpower, within the organisation than concentrating on project implementation.

- Any project brings about change in a major or marginal way and the change is seen as a threat by some. Managing the change, firstly by integration of procedures and systems and at human resources levels are significant issues requiring attention. The divisions involved shall have to be prepared to face the change in an organised manner. Organisational development activities need to be attuned to mange the change or rather selling the change within the organisation.

- When a framework for monitoring and managing post-implementation activities does not back up plans, the plans remain mere expressions of pious intentions. Monitoring process has to be a non-compromisable part of the plan. In fact, documenting and following up monitoring procedures is as important as the plan and performance.

- Impact of project on business shall have to be recognised as a significant area. The creation of champions at different levels of hierarchy could be the right strategy to address to this issue. The champions shall have to be fully conversant with the project, capable of communicating and having full understanding of the concerns of the people likely to be impacted by the project.

Risk Control has three elements, as follows,

Mitigate Risks	Plan for Emergencies	Measure and Control.
Take whatever actions are possible in advance to reduce the effect of Risk. It is better to spend money on mitigation than to include contingency in the plan. .	For all those Risks which are deemed to be significant, have an emergency plan in place before it happens.	Track the effects of the risks identified and manage them to a successful conclusion.

The managerial principles associated with risk planning/control are as follows,

Global perspective

- Viewing project implementation within the context of the larger systems-level definition, design, and development.
- Recognising both the potential value of opportunity and the potential impact of adverse effects.

Forward-looking view

- Thinking towards tomorrow, identifying uncertainties, anticipating potential outcomes.
- Managing project resources and activities while anticipating uncertainties.

Open communication

- Encouraging free-flowing information at and between all project levels.
- Enabling formal, informal, and impromptu communication.
- Using processes that value the individual voice
- Making risk management an integral and vital part of project management.
- Adapting risk management methods and tools to a project's infrastructure and culture.

Continuous process

- Sustaining constant vigilance.
- Identifying and managing risks routinely through all phases of the project's life cycle. Shared product vision
- Developing mutual product vision based on common purpose, shared ownership, and collective communication.
- Focusing on results.

Teamwork

- Working co-operatively to achieve common goal.

- Pooling talents, skills, and knowledge.

Risk planning/control has to address to three fundamental aspects of the project, and they are, balancing scope and quality of deliverables and the extend which to satisfy the customer, time scale prescription and cost of the project as the monitor.

The exercise of this kind has a few important things to achieve,

- Commitment of the organisation as whole and more particularly the top management
- Ensuring adequate and proper communication/consultation within all concerned
- Imbibing the culture of risk ownership
- Internalising risk management as a continuous process
- Facilitating a partnership approach vis-a-vis the outside vendors

Framework for Risk Management

The key elements that need to be in place include:

- nominated senior management individuals to support, own the risk management process and lead on risk management

- risk management policies, and the benefits of following them, clearly communicated to all staff

- existence and adoption of a framework for management of risk that is transparent and repeatable

- existence of an organisational culture that supports well thought-through risk taking and innovation

- management of risk fully embedded in management processes and consistently applied

- management of risk closely linked to achievement of objectives

- risks associated with working with other organisations explicitly assessed and managed

- risks actively monitored and regularly reviewed on a constructive 'no-blame' basis.

Appropriate use of business continuity plans and contingency plans is an important element of the management of risk. So there are likely to be success criteria identified with regard to:

- Building in a risk allowance based on the risk assessment: These funds need to be included in the financial provision. Unused funds for risk allowance can then be redeployed when the activity is completed or if the exposure to the related risk disappears

- Existence of continuity plans: These plans consider how the business will survive should the outcome not be achieved (this would include looking at if a service should fail to come on stream at the required time, or if the users refuse to make use of the service).

Essential elements of risk management

Risk includes the probability of both good and bad outcomes; the consideration of risk has to be set in the context of opportunity. The task of risk management is to limit the organization's exposure to an acceptable level of risk by taking action on the probability of the risk occurring, its impact or both. The principles of risk management can be directed both to limiting adverse outcomes and achieving desirable ones.

Every organisation will have a set of key objectives. Risks should be identified against these objectives, at the highest level. These risks should then be considered and managed by senior management.

Management of risk involves having processes in place to monitor risks; access to reliable, up-to-date information about risks; an appropriate level of control in place to deal with those risks; and decision making processes supported by a framework of risk analysis and evaluation. Risks must be managed in an integrated way at four key levels in order to manage interdependencies – these levels are strategic, programme, project and operational. At a high level, risks can be categorised as follows:

- Business risk – whatever affects the ability to meet business objectives. These risks are managed by the business and cannot be transferred

- Service/operational risk – includes design/build/finance/operate; project risk; these are managed by the party best placed to do so. Vendors and customers share detailed plans for managing risks

- External risk – outside organisation's control, such as legislation, changes in marketplace; providers and customers produce and maintain plans for mitigating these risks.

The minimum requirements for a risk management framework are:

- existence of the organisation's risk policy

- clear identification of main stakeholders

- clarification of the main approaches to be used to identify; assess and report on risks; as well as look at actions to deal with risks

- clear assignment of responsibilities for managing risk and reporting to senior management, especially risks which cut across core business activities and organisational boundaries

- clear audit trail of decisions to ensure that risk management reflects current good practice, with quality assurance of key decisions as input to audit.

The diagrammatic presentation of the framework can be depicted as below,
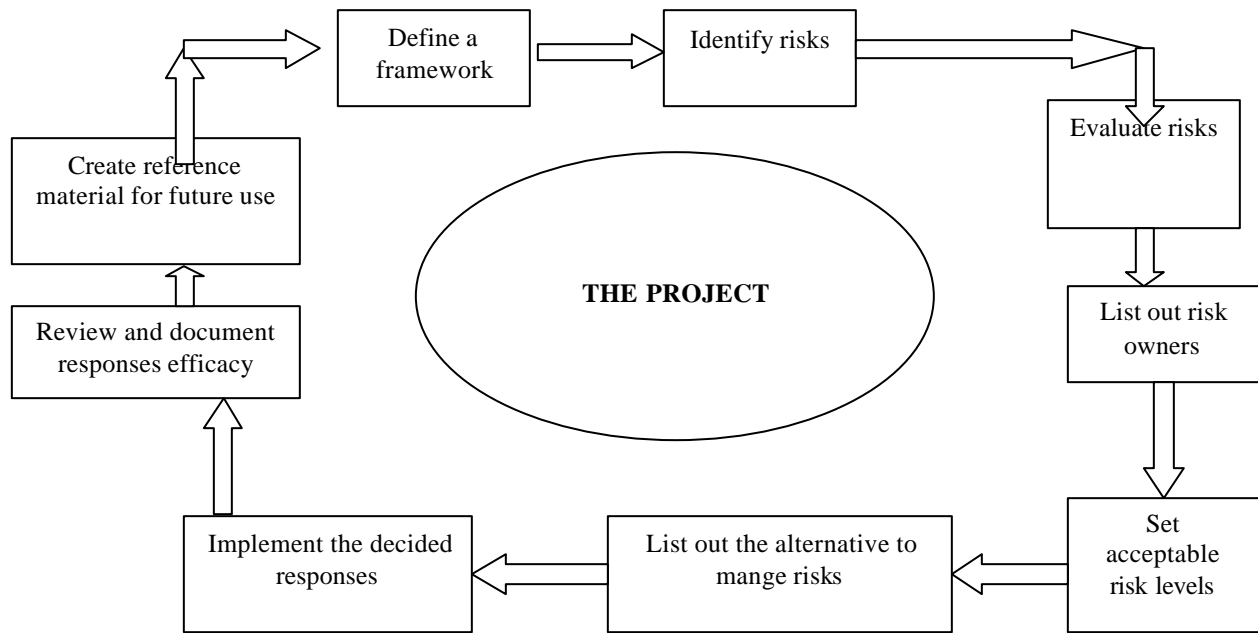
Risks in Risk Management

The risk management process itself is fraught with risks. Unless appropriate measures are not taken in implementing the process, the managing of risk itself can give rise to problems. The risks involved in risk management (RM) are,

- Inadequate resources for RM
- Exclusion of RM cost from business cost and business case for project
- Unaffordable risk treatment
- Wrong mix of RM team
- Risk team not integrated with other project teams
- Late discovery of risk
- Risk of abandoning formal process of risk management
- Optimisation bias
- Planned treatment becoming ineffective
- Inappropriate risk management methods

In conclusion, it must be said that risk analysis and management in project management process are as significant as the project itself. Risking the project with unplanned risk analysis and management can be a sure assurance for project failure. It is a process of an affirmative good and not avoidable evil.

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About the Author

Dr. Vasant Godse is associated as Advisor with L&T Infotech. The article is based on a real life situation of a project failure (not with the present employer.). The views expressed herein are personal views of the author

Dr. Vasant Godse is a banker with nearly three decades experience. He had the fortune of diversified experience, right from agricultural lending in Maharashtra to syndicated loaning in the USA. He has been associated with Information Technology sector for the last four years Winner of a few awards in essay competitions he has published over 75 articles and research papers.

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