CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION OF THE STUDY

A project risk is a condition or uncertain event that may occur during the project. It has the potential to generate negative or positive effects on any one of the project elements such as quality, scope, time or cost (Project Management Institute, 2004). Project risk management is a process that is concerned with identification, analysis, planning, controlling and response monitoring of the risks (uncertainties) in the project. The main objectives of project risk management are to increase the impact and probability of positive events, and decrease the impact and probability of negative events that occur in projects (PMI, 2004). Financial risks are always due to the outcome of business strategy. Financial risks in projects have a direct impact on cost, and if not managed properly may also result in penalty payouts to the client.

The most important factor that will be impacted by risks is cost. The major objective of the financial risk management is to minimize the unplanned conditions or risk events with respect to cash flows throughout the project (Kaplan & Norton 1992). The effectiveness of financial risk management can be measured by the type of strategic decisions it makes throughout the project. It is observed that financial risks exists in several forms. Financial risks are considered as the subcategory of the organization’s
risks. The curtailment of financial risk enables the organization to perform better. Wan et al (2013) have recommended a comprehensive risk management system for effective risk management in case of information technology projects. (Boehm 1991) described the group of risk management principles, practices and techniques that needs to be followed to reduce software rework and increase the success rates of IT projects. The risks that become threats are to be identified, addressed and eliminated. Also the risks that may turn up as opportunities need to be grabbed for achieving higher revenues.

1.2 GROWTH OF INFORMATION TECHNOLOGY

Information technology is the nerve centre of all businesses. Information technology is the study, design, build, development, application, support services and management of computer based systems. The work involves software development and implementation, hardware and software support, upgrades, replacements and managing the organization's technology lifecycle. Information technology industry derives its value from the automation of the business processes, storage of large volumes of information, connecting businesses with its customers, big data and analytics, provision of cloud services, and making earth a smarter planet.

As per a research conducted by Gartner, it is expected that in 2015, the worldwide IT spending would touch $3.8 trillion. The split-up with regards to devices, data centre systems, Enterprise software, IT services and telecom services is expressed in Table 1.1.
Table 1.1 Worldwide IT spending forecast (billions of US dollars)

<table>
<thead>
<tr>
<th>Category</th>
<th>2014 Spending</th>
<th>2014 Growth (%)</th>
<th>2015 Spending</th>
<th>2015 Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Devices</td>
<td>696</td>
<td>3.8</td>
<td>732</td>
<td>5.1</td>
</tr>
<tr>
<td>Data Center Systems</td>
<td>141</td>
<td>0.8</td>
<td>143</td>
<td>1.8</td>
</tr>
<tr>
<td>Enterprise Software</td>
<td>317</td>
<td>5.8</td>
<td>335</td>
<td>5.5</td>
</tr>
<tr>
<td>IT Services</td>
<td>956</td>
<td>2.7</td>
<td>981</td>
<td>2.5</td>
</tr>
<tr>
<td>Telecom Services</td>
<td>1,626</td>
<td>-0.1</td>
<td>1,638</td>
<td>0.7</td>
</tr>
<tr>
<td><strong>Overall IT</strong></td>
<td><strong>3,737</strong></td>
<td><strong>1.9</strong></td>
<td><strong>3,828</strong></td>
<td><strong>2.4</strong></td>
</tr>
</tbody>
</table>

Source: Gartner press release, January 12, 2015

This is an indication of the amount of spending in the area of information technology. Information technology companies support their customer to grow and transform in the business arena that is highly technology dependant. These companies support its customer to improve and develop capabilities to embark on the paths of innovation and change. The technology driven synergies are key for successful mergers, amalgamations, acquisitions, divestitures and consistent growth. The IT maximizes the business results through technology driven initiatives and innovations.

The range of support provided by these information technology companies include:

i. System integration.

ii. Software development, implementation and support.

iii. Network integration.

iv. Web-based development.

v. Offshore development, delivery and support.

vi. Communication services.

vii. Desktop management.
viii. Datacenter set-up, management and support.
ix. IT Consultancy (Operating system, Security, network design, etc.)
x. eBusiness solution development.
xi. Data mining, data collection, data storage, data warehousing and data processing.
xii. Cloud related services.
xiii. Big data and analytics.

1.3 LEADING IT COMPANIES IN THE WORLD

In a study conducted by market business news in Dec 2013, it was found that the world's leading companies in IT are Samsung, Apple, HP, Foxconn, IBM, Hitachi, Panasonic, Microsoft, followed by Amazon and Dell. More than half of the largest information technology companies are headquartered in US, and the rest of the companies are spread across Japan, Europe, India and China. The Table 1.2 shows the annual revenue earned and the number of employees working in these companies.

Table 1.2 The Leading Information technology companies (Dec 2013)

<table>
<thead>
<tr>
<th>Rank</th>
<th>IT Company</th>
<th>Annual Revenue ($bn)</th>
<th>No: of employees</th>
<th>Headquarters</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Samsung Electronics</td>
<td>188.15</td>
<td>221,726</td>
<td>South Korea</td>
</tr>
<tr>
<td>2</td>
<td>Apple Inc.</td>
<td>170.91</td>
<td>80,000</td>
<td>USA</td>
</tr>
<tr>
<td>3</td>
<td>HP Company</td>
<td>112.298</td>
<td>331,800</td>
<td>USA</td>
</tr>
<tr>
<td>4</td>
<td>Foxconn</td>
<td>110</td>
<td>1,200,000</td>
<td>Taiwan</td>
</tr>
<tr>
<td>5</td>
<td>IBM</td>
<td>104.5</td>
<td>435,000</td>
<td>USA</td>
</tr>
<tr>
<td>6</td>
<td>Hitachi</td>
<td>117.8</td>
<td>323,520</td>
<td>Japan</td>
</tr>
<tr>
<td>7</td>
<td>Panasonic</td>
<td>87.94</td>
<td>293,742</td>
<td>Japan</td>
</tr>
<tr>
<td>8</td>
<td>Microsoft</td>
<td>77.85</td>
<td>100,518</td>
<td>USA</td>
</tr>
<tr>
<td>9</td>
<td>Amazon.com</td>
<td>61.09</td>
<td>109,800</td>
<td>USA</td>
</tr>
<tr>
<td>10</td>
<td>Dell</td>
<td>56.94</td>
<td>108,800</td>
<td>USA</td>
</tr>
</tbody>
</table>

1.4 BACKGROUND OF IT IN INDIA

As per Nasscom reports, the information technology industry has elevated its contribution to India's GDP from 1.2% in 1988 to a whopping 7.5% in 2012. In the year 2014, the information technology industry in India generated 88 Billion USD through export and 42 USD Billion though domestic business. Overall 130 USD billion was generated in 2014 from the IT industry.

In 2015, it is forecasted that there will be a 13% growth in the industry which translates to a forecast of 98 USD billion from exports and 48 USD Billion through domestic business. This is depicted in figure 1.1. The overall forecast for revenue created out of IT industry stands at a gigantic 146 USD Billion. The prime highlight is that the exports amounts to ~67%. India stands strong in its position as the global destination for information technology services, partnering in clients growth. eCommerce is growing at unprecedented levels over the last few years. With the Central governments focus areas of "Make in India" and "Digital India ", there is expected to be tremendous boost in the area of information technology in India.

![Figure 1.1 Revenues generated from Indian IT Industry](source: Nasscom reports, 2014.)
As per a study conducted by Nasscom in 2014, where the financial as well as other supporting information of the companies were ranked based on the data submitted, the leading IT companies in India are TCS Ltd, Infosys Ltd, Wipro Ltd, HCL Technologies Ltd, Tech Mahindra as shown in Table 1.3.

**Table 1.3 The 20 leading IT Players in India in 2013-2014**

<table>
<thead>
<tr>
<th>Sl.No</th>
<th>Company Name</th>
<th>Sl.No</th>
<th>Company Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Tata Consultancy Services Ltd</td>
<td>11</td>
<td>MindTree Ltd</td>
</tr>
<tr>
<td>2</td>
<td>Infosys Ltd</td>
<td>12</td>
<td>KPIT Technologies Ltd</td>
</tr>
<tr>
<td>3</td>
<td>Wipro Ltd</td>
<td>13</td>
<td>Zensar Technologies Ltd</td>
</tr>
<tr>
<td>4</td>
<td>HCL Technologies Ltd</td>
<td>14</td>
<td>Hexaware Technologies Ltd</td>
</tr>
<tr>
<td>5</td>
<td>Tech Mahindra Ltd</td>
<td>15</td>
<td>Cyient</td>
</tr>
<tr>
<td>6</td>
<td>L&amp;T InfoTech</td>
<td>16</td>
<td>NIIT Technologies Ltd</td>
</tr>
<tr>
<td>7</td>
<td>Syntel Ltd</td>
<td>17</td>
<td>Infinite Computer Solutions (India) Ltd</td>
</tr>
<tr>
<td>8</td>
<td>Mphasis Ltd</td>
<td>18</td>
<td>Persistent Systems</td>
</tr>
<tr>
<td>9</td>
<td>Genpact India Pvt. Ltd.</td>
<td>19</td>
<td>Geometric Ltd.</td>
</tr>
<tr>
<td>10</td>
<td>iGate</td>
<td>20</td>
<td>MASTEK Ltd</td>
</tr>
</tbody>
</table>

Source: Nasscom industry rankings, 2014.

According to a Gartner study, the top 5 Indian Information technology providers are TCS Ltd, Infosys Ltd, Cognizant Ltd, Wipro Ltd, HCL technologies Ltd (Gartner study). The major information technology hubs in India are situated in Bangalore, Hyderabad, Chennai, Delhi and Pune. This sector has provided employment to the youth in the country and opportunities in the area are predicted to increase tremendously over the years. India has the advantage of the talent pool of large English speaking educated youth which is higher than any other country in the world. The new
drivers in the area of information technology are mobile computing, cloud computing and big data.

1.5 TYPES OF IT PROJECTS

The types of information technology projects are:

i. Infrastructure Projects - Infrastructure projects aims at improving the technical infrastructure of the customer. This includes the datacenter setup and migration projects, server builds, operating system upgrades, application updates, installation of new hardware and networking equipments, security and compliance related activities, tool deployment, disaster recovery of the servers and application etc. These projects are characterized by multiple teams, remotely located data centers and servers, virtual teams which adds to the complexity and hence extra care is needed in managing these projects.

ii. Software Development Projects - Software development projects result in a product which is provided to the customer. These involve the team of programmers writing the code for the project, followed by testing of the code, integration testing, and production handover to the customer. While planning a software development project, the team needs to be careful in defining the project's deliverable, if it is a packaged code or a web based service.

iii. System Deployment Projects - System deployment projects involve install, configure and deployment of the software supplied by a vendor. It may or may not lead to a new service.
So team needs to take extra caution to define the scope, deliverables, budget and the risks.

iv. Organizational development projects - These projects are initiated with the objective to pursue organizational changes or improvements. These may include setting up of a new service line, implement process improvements across the service lines etc. These may be internal projects which may result in changes in staffing, structure or organization culture.

1.5.1 Classification of Projects based on Size and Complexity

i. The project may be classified as small, medium and large based on the duration of the project. This classification again differs across companies based on the types of projects managed.

ii. The project is classified as low, medium or high complexity based on the number of platforms, technologies used, the execution priority, number of implementation locations, number of vendors or 3rd parties involved, number of client organizations to coordinate with, nature of procurements, the requirement properly defined or not, and the visibility from the senior management etc. Again this is decided based on the type of project and the company where it is managed.
1.6  SUCCESS AND FAILURE RATES OF IT PROJECTS

There were many studies undertaken to understand about the success/failure rates in the various information technology companies. The results of these studies have been elucidated as part of this research:

1) A research was conducted by McKinsey & company in association with University of Oxford in the year 2012, on large scale information technology projects. As part of the study 5,400 projects whose initial budget exceeded $15 M and classified as large scale projects were studied (McKinsey & company 2012). The findings of the study were startling:

i. It was found that 17% of these projects fail so miserably that they become a threat to the survival of the company itself. This highlighted the high failure rates in case of information technology projects.

ii. An average of 45% project run above budget and 7% above schedule and achieving 56% less value that initially planned. This pointed to the high number of projects going out of budget and schedule, which severely impacts the revenues.

2) In a survey conducted in Oct 2008 by IBM, to study the success/failure rates of change projects, 1500 change management executives (making change work IBM 2008) were surveyed as part of the study. The outcome was shocking:

i. Only 40% of the projects were closed as per the schedule, budget and quality goals. This revealed the low success rates and was a cause of alarm.
ii. The best companies were 10 times more successful than the worst companies.

iii. The key barriers to success was the people's mindsets and attitudes & beliefs, corporate culture and lack of higher management support.

3) In a study of the federally funded technology projects conducted by US Government accountability office in 2008, it was found that 49% of the projects are either not planned properly or not performing well or both (GAO-08-105IT).

4) In a study conducted by KPMG New ZEALAND (KPMG Project Management Survey 2010), in Dec 2010, the results were stunning:

i. 70% of organizations had faced at least 1 project failure in the last 12 months. This demonstrated the high project failure rates experienced.

ii. 50% of the respondents reported that their projects failed to achieve the deliverables as per plans. This was shocking as it would directly impact the project outcome, and also may dampen the relationship with the customer, and spoil the company's reputation and goodwill.

5) In a research conducted by KPMG group where 600 organizations were surveyed globally (KPMG – Global IT Project Management Survey), in the year 2005, it was found that -
i. In the previous 12 months 49% of the organizations had a project failure. This highlighted the high project failure rates.

ii. In the previous 12 months only 2% of organizations had reported that all their projects were successful.

iii. 86% of the surveyed companies expressed a shortfall of 25% or more of planned deliverables on the portfolio of projects. This was a alarming trend.

6) In a survey of 380 senior executives in October 2008 by Logica management consulting, (Logica surveys), the following were observed:

i. 35% of organizations dumped one major project in the previous 3 years. This could have a large bearing on the customer relationship.

ii. 37% of projects fail to deliver the planned benefits. This pointed to high project failure rates.

1.7 KEY CONTRIBUTING FACTORS FOR PROJECT FAILURES

The key contributing factors resulting in project failures were found to be the following:

i. Lack of project risk management process - Project risk management is very essential part of project management. Right from the planning stage the risks needs to be identified, analyzed and mitigation process put in place. Also the project needs to be monitored on a regular basis for ensuring that the
occurrence of risks does not impact the project performance. Lack in proper project risk management process leads to project failures.

ii. Improper planning - In the initial stages of the project, the budget estimates, resource estimates, communication plan and the project plan needs to be prepared. The architectural design needs to be developed with the support from the architect. Also the initial kick-off meeting with the stakeholders and regular communication thereafter is key for ensuring that the projects do not fail. Any lapse in the planning will have disastrous consequences and eventually the projects may fail.

iii. Improper monitoring and control system - Monitoring and control mechanism is required for ensuring that the performance of the project is on track, and there is no deviation. Any exception, needs to be monitored on a regular basis to make sure the project is not failing.

iv. Poorly defined scope - For any project the initial scope statement is very important for gaining understanding into the requirements, and arriving at the deliverables. In case the scope is not defined properly, this needs to be clarified with the sponsor and communicated to the key stakeholders. Unclear scope is a recipe for failure.

v. Lack of resources - Resource is the key for implementing the project. If there is lack of the specific skill, or the existing resource is on leave, or leaves the organization, it puts the project management outcome in jeopardy in terms of the triple constraints. So in case of situations where the resource is not
available, it needs to be immediately highlighted to the management and actions taken to bring in a new resource, or align a resource from another project. Resource issues, if not tackled initially can lead to project failures.

vi. Lack of user involvement - User involvement right from the beginning till the end is required for the software development/implementation types of project. It is key that the technical teams sync up with the user at regular intervals, so that there is no issues of expectations not matching the outcomes.

vii. Unrealistic time scales - many times, in order to win contracts the schedule is kept very aggressive, and it happens that this itself becomes the reason for failure. Although crashing can be performed for reducing the duration, but still the critical path time is required for completing the work. If in case too many activities are performed in parallel, it may also impact the quality of the deliverable. So sufficient time scales should be part of the initial plan. This should be confirmed only after discussions with the technical teams to ensure that it is realistic duration for completion of the work.

viii. Mindsets and attitudes - Mindsets and attitudes play a significant role in leading to success or failure of a project. The attitudes of the technical teams, the project manager, the end user, the customer, the support staff matter play a key role and only with a professional approach and friendly attitude the project can be accomplished successfully.

ix. Political infighting - This is one the most disastrous thing to happen which can result in project failure. The teams need to
have a healthy rapport with each other. All stakeholders need to interact keeping in mind the best interests of the project rather than personal vendetta.

x. Understating the project complexity - Projects can have multiple complexities, in the form of multiple teams, vendors, technologies involved, dependencies. All these should be factored in the design and subsequently in the project plan. All the underlying complexities should be highlighted.

xi. Insufficient budget planning - In order to win the project, many a time competitive bidding is done. With shoe-string budget, it becomes too tight for delivering the project. In such cases, the outcome gets impacted due to non-availability of sufficient budget. So proper estimation, forecasting and budget planning are very important.

xii. Poor project management and PM methodology- The project lives and grows inside the project management governance structure formed by the project manager. Any lapses in this area can have serious repercussions and ultimately result in failed projects. The project manager needs to develop the project management framework, right at the start of the project.

Ibrahim et al (2013) had conducted a study to examine the failure factors in the information technology projects. It has been found that the failure rates in information technology projects are very high when compared with other types of projects. The study has used literature review to arrive at interesting conclusions. The different types of failures encountered in IT projects has been classified as:
i. Design failures - when the deliverables do not meet the design objectives, it is considered a failure.

ii. Expectation failures - when the system is incapable of achieving the expectation of the stakeholders in terms of the scope, quality, specifications etc, it is viewed as a system failure.

iii. Budget and schedule failures - when the process is not developed as per the budget and schedule requirements, it is seen as a failure.

iv. Integration and interaction failures - when the systems built are not able to interact and integrate as per the expectations, it leads to project failures.

There is ample evidence of project failures in the literature which had resulted in revenue losses. Many factors had been identified that cause the IT projects to fail. Based on the previous studies undertaken by the researchers, it has been found that the causal factors can be summarized as:

i. Lack of top management support - Commitment and support from the senior management is required for ensuring smooth execution of the project and for resolution of issues in project environment. In case where there is lack of support and interest from the top management, it can lead to project failures. This points to the need of having a supportive top management and a collaborative working relationship.

ii. Lack of project management effectiveness - A competent project manager possess leadership, planning and negotiation skills, technical capabilities and monitoring capabilities. The
project manager ensures regular checkpoint meetings, performs communication, reports the status, performs risk management, and collaborate with the top management. In case the project manager is not competent enough, it may turn out to be the reason for project failure. It is evident that a experienced and capable project manager needs to be assigned for managing the project.

iii. Lack of expertise of the teams - The teams performing the work need to possess the required skills and acumen for carrying out the task. Incapable, poorly skilled team members may also result in project failures. This stresses the need for proper screening which assigning the resource to the project.

iv. Lack of user involvement - This can have fatal consequences, and may lead to a failed outcome. The user needs to be involved at all stages, and work needs to progress to the next stage only after the user formally signs off/agrees the milestones achieved till that date. User involvement can be ensured by having regular interlocks and communication with the user.

Aggrawal & Kaur (2013) had conducted a study in the area of information system project management with the aim of arriving at a deeper understanding of the factors resulting in failed projects. An in-depth literature review has been done as part of the research. It has been found that there are multiple reasons for project failures, they include:

i. Absence or inadequacy of risk management practices - Many times risk management may not be part of the project
management process itself, due to which the project team may not be prepared for the impacts of the risks occurring. This might lead to fire-fighting situations which may result in project failures. It can be concluded that risk management practices should be practiced as part of the project management system.

ii. Project complexity - The projects may tend to be complex due to the nature of technologies employed, the design, the interdependencies with other projects, global spread of stakeholders and virtual teams. The key aspects contributing to the project complexity should be clearly defined. Foolproof communication plans should be put in place.

iii. Technology reasons - Use of new or untested technologies and a specific technology going out of support also cause projects to fail. Architect should be engaged for a proper understanding, and formulation of mitigation plans.

iv. Resources - Resource unavailability, skill level mismatch, employee absence and attrition can jeopardize the project outcome. The project manager needs to formulate resource plans to factor the resourcing needs of the project.

v. Ambiguity in scope and deliverables - Unclear definition of the in-scope and out of scope items, and ambiguity on the deliverables may put the project delivery at serious risk. So it becomes very important for the project manager to clarify the scope, deliverables, milestones and acceptance criteria.
vi. External reasons like vendors, competitors and macro economic factors - Delays and issues related to vendors, aggressive competitors, governmental laws and policies, inflationary situation can affect the project. Each project needs to maintain a contingency reserve for facing these kinds of situations.

vii. Dependencies - Dependencies related to the availability of the resources required for the work [personnel, hardware, software, licenses etc] can result in project failures. This needs to be captured early on and used while preparing the project plan.

viii. Incompetent project manager - Project manager is the key player who manages the whole project. He needs to be competent, experienced and possess leadership qualities. He should be a master planner and good communicator. He is instrumental in maintaining a cordial work environment in the team. So the project should be assigned to only a PM who possess all these qualities.

ix. Improper change control - In many situations, there are likely to be changes during the life cycle of the project. If the project changes are not properly managed, it can impact the project success. Proper change management and control process should be defined right at the beginning of the project.

x. Communication - Lack of proper communication among the stakeholders can lead to project failure. The communication plan should define the frequency of meetings, reporting,
1.8 SIGNIFICANCE OF FINANCIAL RISK MANAGEMENT IN IT PROJECTS

The aim of financial risk management in information technology projects is to provide efficient and effective approaches to manage all the sources of uncertainties being any circumstances or risk events that has the capability to cause an impact on the performance of the project. Every organization faces several types of risks which could be known or unknown. Project risk management helps the organization by providing several models and approaches to mitigate, handle, transfer or avoid these known or unknown risks. Every IT project with respect to size, location, complexity or organization can have some measure of risk. The main objective of the project risk management team is not only to remove all types of risks but also to identify all possible positive risks (opportunities) and manage those risks to obtain benefits. The effective strategies of project risk management help in identifying the strengths, opportunities, weakness and threats of the project. Through planning for the unexpected happenings, it could be possible to respond to events when they arouse. In order to make sure the success of the projects, it is necessary to define the methods of handling the potential risks so that, it could be possible to identify, avoid or mitigate the problems when it is necessary. The successful project managers in the information technology recognize that the risk management is significant, since attaining the goals of the projects depends on the planning, preparation, outcomes and the assessment that contribute to attain the strategic goals. The plans of the project financial risk management contribute to the success of the project through instituting a list of some external and internal risks. Typically, this plan comprises of the identified risks, prospect of happening, potential checkpoint meeting etc. Also prompt communication should be made a rule in the team.
influence and planned actions. Usually, the events of low risk possess less or no impact on the schedule, cost or performance. The moderate project financial risks create some increase of cost and performance degradation. High project financial risks create an increase in the budget of IT projects, performance issues and disruption in the schedule. Effective financial risk management increases the success rates of the projects, hence support in improving revenues and good will, which can in turn help in bagging new projects from the customer.

1.9 FINANCIAL RISKS OCCURRING IN IT PROJECTS

The financial risks that are encountered in information technology projects are:

i. Technology risks - The technology risks may be in the form of incompatibility between applications and infrastructure, technology getting obsolete, software component failures or failed changes etc.

ii. Resource risks - Resources form the backbone for any project implementation. Any risk arising due to non availability of resources - employee on leave, employee illness, attrition, skill gaps / skill mis-match, ineffective succession planning, conflicts in the team and low motivated teams needs to be carefully monitored and mitigated at the earliest.

iii. Scope risks - Unclear scope or poorly defined scope is a major reason for project failure. Scope risks include scope ambiguity and Scope changes during the life of the project.
iv. Vendor risks - Any delays from the vendor end, can cause indefinite delays to the project and severely jeopardize the target date for completion. Vendor risks include delays from vendor end, changes in costs of parts during the course of the project, mismatch in parts/software purchased.

v. Requirements risks - In case of unclear requirements, it leads to ambiguity and if not mitigated on time can lead to project failures.

vi. Procurement risks - Many projects may require procurement of hardware, software or licenses, and any delays can be a dependency on the other activities as well.

vii. Design risks - Design is the blueprint of the project, any errors or ambiguity may have tough consequences. The design risks may include design errors, design not taking into account the compatibility of the hardware and the software supported etc.

viii. Project Complexity risks - There may be complex interaction between the teams, technologies, platforms etc. It is necessary to understand the underlying complexities to resolve these risks. The project complexity risks may be due to multiple platforms and applications, and their incompatibility issues, multiple teams involved and their conflicts, updates & upgrades required in applications over course of time, scope changes due to new requirements arising due to complex interactions between the applications.
ix. Planning & control risks - Planning is the most important step to be followed and any misses they will lead to risks occurring during the life cycle of the project. The planning and control risks involve requirements that were missed in the initial planning, improper planning and dependencies that not clearly identified in the planning stage.

x. Organizational and environmental risks - There can be changes happening in the external environment that may result in changes in organization structure, culture, strategies etc, and which can have very important impact on the project outcomes.

xi. Information security risks - This is becoming one of the key cause of worry for the project managers. The information security risks comprise data security, information privacy, disaster preparedness and recovery, compliance.

1.10 CHAPTER ORGANISATION OF THE THESIS

The thesis is organized into five chapters as follows:

Chapter 1: Introduction

The introduction chapter dealt with the background information on the growth of information technology, the leading IT companies in the world, background of IT in India, types of IT projects, failure rates in IT projects, significance of financial risk management in IT projects and the financial risks occurring in IT projects.
Chapter 2: Review of Literature

The review of literature chapter discussed review of previous studies about the need for financial risk management in IT projects, project risk management techniques, the effect of project financial risk management on project success, strategies to reduce financial risks in IT projects and the existing studies in the area.

Chapter 3: Research Framework

The research framework chapter presented details on the research gap, problem statement, research questions, objectives of the study, research hypothesis, scope of the study, research approach, research design, research paradigm, data types collected and its sources, sample, method of data collection and analysis of data.

Chapter 4: Data Analysis and Discussion

In this chapter the quantitative data collected through surveys [primary data] and secondary data from the IT project team members were discussed and the outcomes inferred from the analysis and this provided the view of the investigator on the basis of the objectives and research questions of the study.

Chapter 5: Findings, Conclusion and Future Research

The conclusion chapter comprised the final conclusion of the study by answering the proposed research questions of the study.