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## **Project Risk Management and its Application into Dubai's Fast Track Projects**

إدارة مخاطر المشاريع وتطبيقها في مشاريع المسار السريع في دبي

by

**ABDUL SALAM EL BABA**

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of the requirements for the degree of  
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## Abstract

This thesis has been designed to analyze the risk management of fast track projects in construction sector of UAE economy. The primary objective here is to find out the risks which are likely to be faced by fast tracked projects, analyze the risks so identified to understand their impact and how the same must be dealt with by the project managers to minimize their overall impact. Based on the analysis and the understanding of the risks, a precise and effective risk management strategy is also proposed to be adopted by the project contractors and project managers. Approximately 30 questionnaires were submitted to respondents who were chosen from the industry. The survey responses were then summarized and analyzed using different statistical tools for recommending a risk management framework.

While primary data collection was done through survey mechanism, the secondary data collection was done through collection of data from sources such as government sources, publications made by researchers, website publications and books etc. Analysis made into the data collected shows that risks can arise from both internal and external sources and it was found that even though there is the presence of a good knowledge base in relation to risks but more needs to be done to effectively manage the overall risk management of fast-tracked projects. It was also observed that poor risk management and lack of risk recognition led to bad or poor risk mitigation in a no of projects which led to delays and cost escalations. It is however learnt that managers working in fast tracked projects were well aware of the risk impacts and a better top management recognition of the risk and integration of risk management into project plans would makes sure the risks are well managed and their impacts negated. It is also leant that if risk mitigations measures were undertaken at the right time and projects managers use the findings of the study and work on a pro-active basis for the risk management process, the same can result in higher profitability and ensure better competitive advantage for the contractors and project teams in the long run.

تم تصميم هذه الرسالة لتحليل إدارة المخاطر لمشاريع المسار السريع في قطاع البناء في الاقتصاد الإماراتي. الهدف الرئيسي هنا هو معرفة المخاطر التي من المحتمل أن تواجهها المشاريع السريعة التتبع ، وتحليل المخاطر المحددة على هذا النحو لفهم تأثيرها وكيف يجب التعامل مع الشيء نفسه من قبل مدي المشروع لتقليل تأثيرهم. بناءً على تحليل المخاطر وفهمها ، يُقترح أيضاً اعتماد استراتيجية دقيقة وفعالة لإدارة المخاطر من قبل مقاولي المشروع ومديري المشاريع. تم تقديم حوالي 30 استبياناً للمجيبين الذين تم اختيارهم من هذه الصناعة. ثم تم تلخيص وتحليل الاستجابات باستخدام أدوات إحصائية مختلفة للتوصية بإطار عمل لإدارة المخاطر. في حين تم جمع البيانات الأولية من خلال آلية المسح ، فقد تم جمع البيانات الثانوية من خلال مصادر مثل المصادر الحكومية ، والمنشورات التي أدلى بها الباحثون ، ومنشورات الموقع الإلكتروني والكتب. ويظهر التحليل الذي تم إجراؤه في البيانات التي تم جمعها أن المخاطر يمكن أن تنشأ من المصادر الداخلية والخارجية على حد سواء ، وتبين أنه على الرغم من وجود قاعدة معرفة جيدة فيما يتعين القيام به لإدارة فعالة لإدارة المخاطر الشاملة المشاريع سريعة التتبع. ولوحظ أيضاً يتعلق بالمخاطر ، إلا أنه لا يزال هناك الكثير أن سوء إدارة المخاطر وعدم الاعتراف بالمخاطر أدى إلى تخفيف المخاطر بشكل سيء أو ضعيف في عدد من المشاريع التي أدت إلى التأخير وتضاعف التكاليف. ومع ذلك ، فقد علم أن المديرين الذين يعملون في مشاريع سريعة التتبع كانوا يدركين جيداً تأثيرات المخاطر وأن إدراك الإدارة العليا بشكل أفضل للمخاطر ودمج إدارة المخاطر في خطط المشروع من شأنه أن يتأكد من إدارة المخاطر بشكل جيد وإلغاء آثارها. كما أنه من الواضح أنه إذا تم اتخاذ تدابير لتخفيف المخاطر في الوقت المناسب واستخدام مديرو المشروعات نتائج الدراسة والعمل على أساس استباقي لعملية إدارة المخاطر ، فإن نفس الشيء يمكن أن يؤدي إلى زيادة الربحية وضمان ميزة تنافسية أفضل للمقاولين وفرق المشروع على المدى الطويل.

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# Chapter 1-Introducton

## 1.1 Introduction

The introduction chapter is prepared to introduce the project content to the intended users and for explaining the requirement of the research on the designated topic. It contains the objectives and primary scope of the study apart from dealing with the methodology which would be adopted for this study. The introduction chapter also lets the user known of the research hypothesis. It would also make an outline of how the research would pan out in the form of contents and chapters.

## 1.2 Background

Project risk management involves the identification, analysis and responding to any risk that arises over the life cycle of a project for making sure the project remains on track and is able to meet the goals. Risk management isn't reactive only and it shall be designed to be part of the planning process to figure out risk that might happen in the project and how to control that risk if it arises in the projects implementation phase.

It can be noted that risk can arise in any step of the project processes and thus it is a necessity to be ready to deal with risks of any kind form the very beginning. Because risk can be greatly affecting the goals of the project and affect its projected outcomes, it is highly necessary to go for identifying, categorizing, prioritizing and planning for risks before these risks can become serious issues in projects later phases.

Fast tracking in this background can be defined as the process of the rearrangement of the predecessor relationships (steps) to shorten the overall project schedule and can be used as a strategy to avoid too much risks or escalating costs to reduce duration of the project. In fact, the fast tracking can be used to reduce project deadlines without significant increase in the overall project cost. Fast tracking technique can be used not only in concretion mega projects but also in other projects as well. The fast tracking is usually involved the project overlapping and because design of the project is generally completed before the same is implemented, overlapping would help in the reduction of the overall project completion duration. However fast tracking of a project after the initial design is made and project is implemented would lead to increasing no of change orders and loss of productivity and efficiently and the same might

lead to increased cost. So, it might not be possible to fast track projects always without increased costs. Fast tracking at a later stage of the implementation would definitely lead to higher project costs if the changes are not managed well and in a planned manner. Different studies of construction projects, it has been found that in fast track projects the number of project designs changes were higher in number, the number of project changes order was not very high and different, but they were actually very different in regards to the projects which were of similar nature but were not fast tracked. It was found that these reasons would lead to project expedition of fast track project and manage construction projects by keeping up to increased client demands.

The emphasis of the current study would be to follow how fast track projects are planned and executed keeping in mind the fact that many risks might not have been taken into account while planning for execution as defined in the next chapter. The non-planning of risk management would lead to higher risk impact and would derail the project goals from being completed in time and would also be expected to increase projects costs.

For this purpose, the current research dissertation would look into aspects of risk management practices undertaken by project teams in many of the Mega fast track projects executed in the recent past or those which are under execution in Dubai and UAE to meet the deadlines like Dubai Expo pavilions and Al Maktoum International Airport (Barkley, 2004) and the Expo 2020 venues. It would also be explored if Risk management practices undertaken by the Project teams in such fast track projects like Dubai Expo etc. are enough to manage and eliminate the negative effects of Risk arising in the implementation and after life of the projects (Allen, 2017).

It can be noted that Poor risk management in big construction and infrastructure development projects is a direct consequence of inadequate recognition of the risk involved and not responding to the risks which are identified in a timely manner and the same can be devastating for a number of projects. Positive changes can be made to risky projects if the risk involved are identified in time, analyzed in detail and mitigation measures are initiated and observed and modified to get to the goals with limited variation in cost and quality terms (Akintoye, Goulding, & Zawdie, Construction innovation and process improvement., 2010). This dissertation research would make an endeavor to find if the risk management practices in fast track projects in Dubai and UAE are adequate enough to mitigate risks and makes sure projects are completed without too negative variations.

### 1.3 Research Problem

The following Research Questions would be explored for getting the right answers as to whether the risk management practices are suitable enough:

- a) What are the risks affecting/considered in the planning process of fast track construction project in UAE and how are classified?
- b) What risk management concepts/frameworks are used by project managers in the planning process for fast track projects? Are those applying to the UAE's construction industry?
- c) What are the standard mitigation plans that can be in phase for the better manage/control standard risks in fast-track projects in the UAE?

### 1.4 Aim of the Research

The aim of this research is to find out if the project planners intend to include risk management in the planning phases of projects being implemented on a fast track basis. Identification of techniques were further looked in this project and different methods those were specifically suited for the identification and control of risks in the fast track planning process projects of UAE construction industry. This research project would look into how the project managers integrate risk management into the planning process of projects being implemented and if Risk management practices undertaken by the Project teams in projects like Dubai Expo etc. are sufficient to manage and eliminate the negative effects of Risk arising in the implementation and after life of the projects (Allen, 2017).

### 1.5 Objectives

In the project risk management, firstly identification is involved after that analysis and lastly responding of risks that arises over the life cycle of a project to make sure that project always remains on the track and helps in meeting the goals. It has been found that risk management is not only reactive but it should be designed to be a part of the planning process that helps in figuring out risk that will happen in the project and the ways to control risk if in fact occurs. It can be noted that risk can arise in any step of the project processes and thus it is a necessity to be ready to deal with risks of any kind from the very beginning. Because risk can be greatly affecting the goals of the projects risk management is necessary for identifying, categorizing, prioritizing and planning for risks before they become issues. For this

purpose, the current research dissertation would look into aspects of risk management practices for many of the fast-tracked Mega projects being undertaken in Dubai (Barkley, 2004).

- a) To review the literature on risk management and to fast track projects
- b) To investigate and identify the risks, considered in the planning process of fast-track projects in the UAE's construction industry and classified them.
- c) To investigate different project risk management concepts, frameworks and how they apply to construction projects in the UAE.
- d) To propose a framework of how risk management can be better use in the planning process of fast track projects

## 1.6 Purpose of the Research

The primary purpose of the research is delving deeply into the fast track project environments in UAE and Dubai where a large no of projects is put into fast track area to complete the same projects in a very timely basis and to make sure the projects are integrated into the economy as quickly as possible. It would be one of the endeavor to know how the project environment changes if a project is fast tracked and how the same bring new risks into the project space and what the project teams do to tackle such risks to be able to complete the projects in time and save costs (Creswell J. , 2009).

## 1.7 Research Hypothesis

Following hypothesis would be tested in the research data analysis phase:

- a) If there is a large correlation between the successful implementation of a fast track basis project and the integration of risk management in the planning phase of the fast track project?
- b) Do Managers believe in undertaking risk management practices reduce costs of a fast track project in the long term?

## Hypothesis

**Null Hypothesis (H<sub>0</sub>):** There is the presence of a statistically significant relationship between the between the perceived necessity of risk management and its general implementation of the risk management process and framework in the in fast track construction projects in UAE.

**Alternative Hypothesis (H<sub>A</sub>):** There is the presence of not a statistically significant relationship between the between the perceived necessity of risk management and its general implementation of the risk management process and framework in the in fast track construction projects in UAE.

Level of significance is 5%.

## 1.8 Research Methodology

As per the demand of the current research it has been observed that questionnaire needs to be used in order to explore the phenomenon of fast track projects that's take place in UAE. The major aim was to compile the accurate profile that helps in developments in the emergence of area, the most suitable design chosen was descriptive. The major advantage of using the descriptive research design is that it is distinctive in the quantity of variables used. Several variables can be accommodated but only one will be required to answer the question (Zikmund, 2009).

Most researchers prefer to use both qualitative research and quantitative research built into their researches. This is because most of the researches come up with both numerical data and non-numerical data for their analysis. If the variables and the data is both types and one can't be totally omitted then it is paramount to have mixed research paradigm to include both qualitative and quantitative methods and the current research is making an attempt to have both methods included for data collection and data analysis (Bryman, 2012). Therefore, a mixed research approach would be used for the current dissertation.

The Research analysis is aiming to make sure of the mixed method (which consists of both qualitative methods and quantitative methods) to bring the required data and previous knowledge in to analysis. The survey is conducted after the secondary research such as the review of the literature is done, and concepts and frameworks and parameters were duly identified and noted. As per the study the embedded mixed-method design was used, where the quantitative pre-test data and results are performed before the qualitative process and interpretation of post data and results (Creswell J. , 2009). The questionnaire is designed as a power tool for collecting the relevant data and including adequate number of respondents to be part of the data collection exercise.

## 1.9 Sampling and Data Analysis

The Data Analysis would be based on the samples which were collected through distribution of the questionnaires to the 30 respondents. The respondents who would be included in the questionnaire are chosen from the construction industry and was either working with contractors in large construction project or with sub-contractors etc. Descriptive analysis enabled frequency tables, means, standard deviations and rankings are used in the analysis to be established. For representation purpose the charts would be intended to be produced with the help of Microsoft excel as well. Appropriate data analysis would be undertaken with the help of appropriate testing measurements such as t-tests, ANOVA, SPSS etc. for testing the hypothesis.

## 1.10 Significance of the Study

A lot of project being undertaken in the GCC region and particularly in UAE is being fast tracked. It has been observed that Clients often opt for the fast-tracking method because they want to achieve or preserve a competitive advantage which they would get if the projects are integrated faster and that too without sacrificing the high quality requirements (Smith, Merna & Jobling, 2009). However it has been observed that fast track projects often face new risks as compared to normal projects and hence project teams need to put in place new risk paradigms to tackle these risks and negate their ill effects. Emphasis is being put to find out the most damaging risks which are being encountered also to find how the same is going to be managed. It would be interesting to know if the current fast track environment is able to manage these risks and pave way for future project teams to manage these risks well in saving costs and executing projects in the deadlines allotted to them.

## 1.11 Scope of the Study

The scope of the current research is limited to fast track projects in UAE. However, it might be noted that the specific data regarding collection of data is very sparse in UAE and thus data is being collected from construction companies from local and international sphere who are either working in UAE or previously worked in UAE. How the risk was encountered by construction companies, which particular risk were perceived to be more dangerous and difficult to handle and which methods were applied by project managers to tackle the risk effectively are crux of the research. It would also be seen and discussed if the measures which were undertaken previously are going to be effective in today's environment or more and more modifications would be needed to make them effective (Crotty, 2008).

## 1.12 Chapter Briefing and Conclusion

A total of five chapters would make up this research Dissertation. Chapter 1 of the research is introduction about the research project and is aimed at providing a general back ground of the research and includes aims of the research, objectives, research questions, their significance and scope of the research. A small discussion as to how the research would be conducted is also given in the research methodology section of the chapter 1 (Allen, 2017).

Chapter 1 is followed by the chapter two which is the literature Review chapter. The literature review would include details of the risk management process, definition of fast tracking of project, methods involved in fast tracking, the risk management framework and other concepts. The risk management system would be discussed in elaborate and it would be described how fast tracking allows for a general advanced integration and if the same is tackled effective by the research team. Overall the development of the research methods is quite dependent upon the literature review.

Chapter 3 which is the Research methodology would discuss the methodology that has been used in the study. Whereas description of the research design is done, it includes the study of the population and sampling methods and data collection methods, justifying the selection of these methods.

Chapter 4 of the report is that of data analysis and data interpretation and would be sued to find answers to the hypothesis and the research questions.

Chapter 5 would include the discussion of the results obtained under the data analysis chapter and would include necessary recommendations for project teams to be applied to tackle the project risk which arise in the implementation of the fast track projects.

It has slowly and steadily emerged that many projects are now days fast tracked and more so in the case of Dubai and UAE as multitude giant projects are being implemented on a war footing. This is why it has become highly essential to study fast track projects on a specific market basis. This current research aims to study the fast track projects being implemented in UAE and would strive to identify the methods which are being employed to efficiently manage and complete the fast track projects in UAE.

## Chapter Two-Literature Review

### 2.1 Introduction

Project management is defined as the specific application of special knowledge with the help of necessary tools and equipment's along with techniques to achieve the goals set by temporary endeavors like building a bridge or an airport etc. in such the project is an unique set of operation to reach a specific goal with the help of project personnel and specialists (PMI, 2004).

A key factor which often is used to distinguish the project management from that of normal 'management' is the fact that project management has a specific timeframe and is often a temporary operation undertaken to reach aa specific goal and once the goal is achieved the project organization is abandoned unlike management which is an ever going and ever-increasing process. For management of a project professional need specific set of knowledge and skill which can only be imparted through training and course being taught along with normal formal education.

However, it must be remembered that Projects being temporary can also be long term in nature and a project would often involve great deal of uncertainty in implementing the needful. This is where risk management expertise comes into play and Project risk management involves the identification, analysis and responding to any risk that arises over the life cycle of a project for making sure the project remains on track and is able to meet the goals. Risk management isn't reactive only and it shall be designed to be part of the planning process to figure out risk that might happen in the project and how to control that risk if it in fact occurs (Barkley, 2004). It can be noted that risk can arise in any step of the project processes and thus it is a necessity to be ready to deal with risks of any kind form the very beginning. Because risk can be greatly affecting the goals of the projects risk management is necessary for identifying, categorizing, prioritizing and planning for risks before they become issues.

### 2.2 Project Planning and Risk Management

Project planning is the process which is related to identifying the activities which are necessary to be completed to produce a project and the same includes specified key deliverables like the budget and schedules etc. the objective of the planning phase is to identify and pin point the measurable and accurate plan which an impact the key areas of the deliverables in a positive manner. Often it is found

that a huge amount of resources can be required to execute the planning phase itself and it would layout the path which if executed well would lead to the achievement of the project's goals. The project planning phase is very critical from the perspective of making sure that all the key resource areas like the HR, Finance, communications etc. are integrated and lesser amount of resource use for the best output under the circumstances. All the key Areas would be duly evaluated and integrated and the plan is then expected to be presented for the approval of the management and the client. The project plan so prepared would be expected to remain the living document for the project team for the entire duration of the project period.

Risk in this scenario can be defined as the possibility of a negative deviation from the goal and includes all those constraints which can individually or combinedly put the progress of the project on a slower pedestal and make sure the project objectives are not achieved within the given plan and the committed resources. It thus becomes essential for the planning team to include a plan which would enable the management to manage the probable risks anticipated for a given project. All projects have a no of risks which are anticipated to emerge during the implementation process and it always falls in need to have a project risk management plan in place to effectively tackle the issues created by these risks.

Risk management is thus a necessity to be included in the projects plan in the planning stage itself to alleviate the delays and cost escalations. Risk can come in to form of a lot of things like technological constraints and non-availability of manpower skilled enough. The risk management plan would thus go a long way in identifying and making sure it anticipates the possible scenarios and issues which can derail the project progress and make effective plans and put them in place to mitigate and transfer them effectively to reduce and negate their impact. Thus, it is highly necessary that the Project risk management plan becomes the part of the overall project business plan and is inserted into the planning document from the initial stage of the project itself.

The project risk management plan at all times would contain the following attributes and elements:

- Process: All the probable stages of the project would-be analyzed to identify the possible risks and suggestions and plans would be included as to how to mitigate and negate the risks identified.
- Budget: Project risk management plan would need to deliberate on the probable methods to tackle changes and escalation in the projects budget etc. as and when the need arises.
- Work Breakdown structure: The work breakdown structure must be devised adequately so that all the identified risk are transferred to the concerned risk managers and the same must be handled by the risk managers in charge as needed in the implementation phase.

- Risk Register: The risk register must be maintained by the project team to enable the project manager to identify risks and their impacts. It shall be also stated as to how frequently the risk register shall be inspected for adequate mitigation of the risks.
- Roles and Responsibilities: Roles and Responsibilities are needed o defined clearly with no ambiguities and the same would allow the project team to manage risks in a better manner when the project runs into an issue with risk attached to it. Risk managers for possible risks must be identified in advance:
- Reporting Structure: The reporting structure needs the to be elaborated as to who would report to whom in case a new risk is identified or an existing and identified risk is creating issues despite being worked upon. Reporting Structure briefly elaborates on the reporting structure in the situation of encountering a risk and in whose hands, do the decisions need to lie.
- Risk Categories: The risk which were identified in the initial stages of planning are required to classified into several categories with the risk manager being identified and the same could be helpful for easy and earlier mitigation of the same.

If in the planning phase Project deadlines are kept too tight, it might lead into project delays and to avoid delays and missing of deadlines project teams and management must remember the fact that project activities must be give and provided enough times to complete the activities normally. However, there can be circumstances and lack of resources which delays projects. In the case of Dubai there are more than a single important cause of project delays. Dubai Projects present many special cases for operating of the project management under different and difficult circumstances such as:

- a) very rapid growth requirement of construction in Dubai
- b) Construction schedule is often found to be tight.
- c) Architectural features included in the projects are so unique that it requires special knowledge ad tweaking of engineering knowledge.
- d) Often there is involvement of contractors from outside and foreign consultants and they take time to get adjusted to the demand and the cultural set ups.
- e) Religious practices and demand from project owners
- f) Workforce which is more often not local and derived from a multi-cultural back ground
- g) A verity of mixed contracts and conditions put in by the project owners also act as a deterrent in project progress if not planned accordingly.

### 2.3 Fast Tracking of Large Projects

As professionals often experience delays on account of many projects and a general lack of required resources, they often use project techniques to finish projects in time or before time. For example, project management professionals use the concept of fast tracking the projects to make sure project completion is done in time scheduled. Here it is quite necessary to understand the concept of fast tracking of projects and why the same becomes a necessity for project managers in a competitive economy like Dubai.

### 2.4 What Is Fast Tracking of Projects?

Projects are often known to be taken up in a sequential manner. When one task is completed, the next task is automatically undertaken. However, if the project needs to be completed in a shorter time and the client does not want to wait for sequential order then it might be possible to start few tasks at the same time if it is possible for many tasks to be undertaken simultaneously in a given project. This means if task 2 does not need the completion of task 1 then both tasks can be undertaken at once. It is one of the necessities in fast tracking that both tasks are independent of each other. But fast tracking can only be applied if the activities in question can actually be overlapped. This can be critical for many large projects because fast tracking unlike project crashing does not involve more costs (extra costs) to be incurred and only needs the activities and tasks to be rearranged.

Fast tracking in effect is the rearranging of the predecessor relationships to shorten the schedule and can be used as a strategy to avoid too much risks or escalating costs to reduce duration of the project. In fact, the fast tracking can be used to reduce project deadlines without significant increase in cost. Fast tracking technique can be used not only in construction mega projects but also in other projects as well. The fast tracking is usually involved the project overlapping and because design of the project is generally completed before the same is implemented, overlapping would help in the reduction of the overall project completion duration. However fast tracking of a project after the initial design is made and project is implemented would lead to increasing number of change orders and loss of productivity and efficiency and the same might lead to increased cost. So, it might not be possible to fast track projects always without increased costs. Fast tracking at a later stage of the implementation would definitely lead to higher project costs. Studies of construction projects revealed, however, that while there were more design changes in fast-tracked projects, the total number of project change orders was not significantly higher and different than in similar projects that were not fast-tracked. Because of this

Fast-tracking might be a very reasonable way to project expedite and manage construction projects by keeping up to increased client demands.

## 2.5 Project Crashing Method

The other alternative to fast tracking is project crashing by project teams. If fast tracking is unable to save time, then project managers can resort to project crashing. However, unlike Fast tracking this requires additional resources and funds, but it uses the least amount on an estimated basis. The activities are analysed as to how much cost is incurred normally and how much time can be saved by crashing the task and most importantly if it reduces overall project time frame and probability of finishing the project within the deadlines increases. Project crashing is able to achieve largest project time compression with the least funding amount.

This method analyses the original costs, total crash cost and categorizes the tasks on the basis of the lowest cost involved. It identifies those activities which can be crashed to ensure they offer incremental value with least cost allocation. Activities with the flattest slope are identified for crashing first. However, a project team undertakes crashing if it finds crashing to reduce the time duration of a project under real conditions and reduced the Critical path identified (MANTEL, 2009).

## 2.6 Why Fast Track projects or Crash projects?

Construction costs have been increasing at approximately 12-15% per year. As a result more project clients are using project management expertise and knowledge to reduce costs and complete projects quicker to save both resources and costs. Fast tracking of a project helps in the reduction in the time required for construction and thus be able to save construction costs. As a result the project can be completed in a lesser time means the assets is built fast and put to use to make revenue earlier than expected. However fast tracking is not something which can be done with every project and it's not something which can be done by every project manager. If not integrated well the fast tracking would result in Chaos and uncertainty. There it is necessary to use the expertise of an experienced skilled project manager and team members who has worked in similar situations and knows fast tracking. Fast tracking method won't be successful if it's not coordinated well and communication is well orchestrated. However, it would be critical to find the critical paths first and then use fast tracking or crashing methods. There is no benefit in fast tracking activities which are not in the critical path (CPM) as the same would neither reduce costs nor make it faster to complete a project.

## 2.7 Fast Track – Advantages

Apart from being able to increase revenue quickly and put the new asset into use, fast tracking would have many advantages and the same is discussed as follows:

### 2.7.1 Catching up with the Backlog

By fast tracking projects after the recessionary period is over many projects which are languishing can be completed sooner and put to use. The same provides an indication as to how the client is serious about getting the asset ready for making use for the intended use. For example, the Dubai International project was fast tracked to make sure the burden of the other Airport is reduced and to fasten the development of the area just outside of the new expansions made. This helped send a signal that the government is willing to expand beyond the traditional and private parties can bring in their innovation to increase the pace of development.

### 2.7.2 Leaping Quickly into the Big League

Dubai has bene using fast tracking to make sure the projects of large scale are finished in time and to attract new travelers and to attract more. The Dubai economy is slowly and steadily being converted into a service and hospitality industry. Oil economy is being replaced with a tourism industry and the administrators know the sooner the infrastructure is built the better would be the flow of tourists and economic growth can be sustained in the long term. By doing so it also hopes to attract talent from economies like that of India for making sure the manpower shortage is tackled and more technology-oriented industries can be developed. More and more manufacturing and transportation hubs are created through fast tracking.

### 2.7.3 *Reduce construction costs*

one of the advantages of fast tracking (if possible) is that t might be helpful in reducing construction labour costs. This can eb achieved through reduction in the no of days of construction and allied activities. As labour costs along with material costs increase quite rapidly (expected to be 10-15%) per annum, t often helps to fast track and save 10-20% of the project costs and put that as working capital in the initiation of revenue generating activity.

#### *2.7.4 Savings through advance purchase*

Material costs can fluctuate rapidly and on a daily basis. Transport and other direct costs can also change pretty quickly. These large-scale variations can be controlled and reduced through bulk and advanced buying. And advanced and bulk buying makes sense only when the parallel activities are being implemented under fast tracking of projects. Thus, fast tracking enables savings on account of long-term buying arrangements as well.

#### *2.7.5 Closer Collaboration*

Communication and collaboration are crucial for success in a fast track project, but this is actually an advantage. As the overall time frame is reduced and compressed, the same requires the whole team to be extremely well organized and know their responsibilities. Fast tracking requires each team member to share information quickly and help in the spread of coordination. If a project like Dubai Expo is being fast tracked, then the contractors which would be involved in the execution are hired in advance and given a chance to be part of the design process so that they know in advance what to expect from the project and assemble a team for meeting the required deadline and quality. The contractor is then part of the design and planning phase and hence ambiguities are eliminated. It also creates an environment for making sure a pragmatic design is put in place and approval is taken from the clients.

### **2.8 The Disadvantages of Fast Tracking of Major Projects**

However Fast tracking is not always an option for project managers and particularly so when the activities can be overlapped and must follow each other. Disadvantages of fast tracking are many and they must be tackled manfully to be able to use the technique safely.

#### *2.8.1 Quality issues are one of the Major issues*

Fast tracking overlook quality requirements as the emphasis is put on completion of the project as soon as possible and more than one task is taken up at a time. Errors and omissions can occur when the project team working in a hurry. A project involving huge scale of construction can be too cumbersome and complex and hence missing one part might cause quality and appearance to be altered. In such a case where in place like Dubai where many contractors of different sizes are working together, keeping them all together and coordinating all of them to get to the designated quality might be a herculean task. Field conditions may be different from expectations and Coordination of changes with the designer and the consultants becomes an absolute must.

### *2.8.2 Planning Issues*

As projects are put into fast track mode the speed needed for the execution of such projects leaves much of planning needs behind. In the case of fast tracking the space between the design phase and the phase of construction is very small and as a result of which the errors in the design and planning phases are difficult to be caught. As more than one phase of the project is put into implementation and more than one project team is in charge it becomes that much difficult for the project manager and risk managers to find the errors and omissions if any. There can be multitude of change orders in such different phases being constructed simultaneously as there would be request for their changes, rebuilding of some phases or parts would be needed, materials would be wastes and labor need would multiply. As fast track projects would require multi-tasking the same would mean consultants would be busy working on different aspects of the projects at the same time and this means some of the issues would not be detected and some won't be worked upon because of lack of detection. Each task which would be required to be suspended because the other tasks can be taken up in their place would mean there would be huge wastes of time and manpower.

### *2.8.3 Unrealistic Client Expectations*

Clients in fast tracking projects are found to be one of the biggest sources of bottlenecks and waste of time and resources. Some clients might not at all understand the pace of construction and quality requirements and as a result of the same they would start demanding inclusion of certain things and exclusion of certain things which eventually would require redesign etc. this is where the role of the consultant becomes more important as they would need to work on placing more emphasis on the understanding the phases of construction by the client and their representatives. If close association and right mindset can be achieved, then the same might lead to saving of costs related to construction and time. Contractors would thus be required to be allowed to work closely with the clients approved designers and planners so that necessary inclusions and exclusions can be discussed in detail in the planning stages. It must be noted by project managers and contractors that clients who don't understand the civil contractors' requirements and have an unrealistic ideas which can't be put into use must end up being unhappy and this can be avoided if there is right kind of collaboration and co-operations etc.

## 2.9 What can possibly cause a Project to be Delayed?

Many factors contribute to project delays including:

### 2.9.1 Large Scale and High-Quality Requirements:

In Dubai, there are many ongoing large projects going on at the same time and which requires not only huge manpower but also demands different technical aspects and expertise which is pretty impossible to assemble from the local workforce and expertise. Projects such as Dubai International airport, Dubai Marina, Dubai Expo and Souk Al Khaleel often demands huge expertise and each one so technically different to demand superior experience and technical capability. Requirements are high quality in workmanship and material needed and also in terms of design which delays most projects in the planning stage itself owing to long time needed for project design approvals and then putting the work into process. Also, the same often needs manpower which is not readily available in the market.

### 2.9.2 Involvement of international consultants and contractors

Designs are so complex and demanding that the same requires radical thinking and out of the box approach. Such designs and projects can't be done by the local designers and project managers and hence international contractors and consultants would be required to design the projects and give it the initial shape for starting the work. Many foreign companies then get involved as they bring new technology and new designs into play but prove to be costly. However, they also help bring new technology which is not available in Dubai and UAE. Management techniques which are employed in foreign countries are then applied to make it easier to construct new projects. However, because many agencies are involved in big projects chances of delays owing to disputes of many kinds come into play and delays projects.

### 2.9.3 Adoption of Traditional Procurement Approach

Most Project despite being complex use the traditional procurement approach. Under this method the client or the developer of the project is generally known to employ a designer for best design of the project. The consultant is appointed to take care of the design and finalize the design. Once the design is finalized, the client or the developer proceeds to finalize a main contractor for undertaking the implantation strategy and finish the project in time. The contractor would make the tender documents and the suppliers with the lowest tender would get the procurement contract. The contractor needs to

take responsibility to all the workmanship and materials which including all works by the sub-contractors.

Based on the traditional method of procurement the client has contractual relationship with all parties involved and client would have closer control over the project works. However, one of the biggest advantages of the such method is that the quality of the project work tends to be better and also client was able to exert better amount of control over the consultants, contractors and sub-contractors. International contractors also use the FIDIC method of contracting with local vendors and most of these vendors have less capacity and can't increase supplies when needed on a larger scale.

One of the other advantages of the traditional procurement approach is that the client chooses the best contractors and suppliers through tendering. Also, the construction cost is likely to be very competitive as the same is based on full design specification of the project. Compared to other methods the traditional method is easier to adopt and also because it is one of the most common method of procurement.

However, it must be remembered that traditional procurement approach might not be totally without its pitfalls. This is particularly because the client had to manage many parties at the same time as many small parties are involved in the project implementation. If there is an issue between parties, then they need to communicate with each other but they can't do so as they need to communicate with the client first and this might cause significantly higher inconvenience for the client and the parties involved in procurement (Alitheyan, 2015).

#### 2.9.4 Presence of Large number of small contractors

The Dubai Construction and project management industry is mostly besotted with the issue of smaller forms with smaller capacity and with a capital of lesser than AED 1 million. As a result of which (non-existence of large sized contractor) many small contractors have to be employed and the same create problems of coordinating too many contractors in large project. This often leads to delays and the projects get easily affected by the smaller fluctuations in the market owing to lower absorbing capacity of these contractors.

### 2.9.5 Over commitment of construction Firms

As a large no of projects are going on at the same time, it often needs involvement of large no of contractors and each small contractor enters into multiple contracts at multiple locations. Given their lack of financing and lack of resources they often fail to meet the demands, and which often leads to lag in projects being implemented.

### 2.9.6 International Workforces

The workforces employed in projects are of mixed nationalities, which bring different traditions, rules, habits, religious practices into operations. For example, the religions holidays include holy Friday for Muslims but not for others and Sunday holiday for Christians but not for Muslims and regular holidays are applied for Indian migrant workers. The overall impact of such a multinational workforce is often difficult to manage and can be a cause of worry in festival seasons as work progress would be often slow.

### 2.9.7 Lack of skilled labour and high-quality professionals

Given a large no of projects are going on at the same time, it often needs involvement of large no of skilled professionals like designers, engineers and supervisors etc. to oversee project work is smoothly progressing. However, the availability of local talent is pretty low and as a result of which project contractors face difficulty in procurement of skilled employees and also face high turnover. In the peak of the demand the delay in finding alternative employee often leads to delays and confusion.

### 2.9.8 Language can be a significant Barrier

The language used in project contracts is Arabic and then the same is translated into English. Many project contractors and consultants take part in project activities without qualified interpreters. As a result, communication gaps often appear in these projects. Quality of work suffers as a result of non-understanding of contract terms and unusual language interpretations and use of Arabic is one of the daunting tasks to be understood in contract formation ad interpretation.

### 2.9.9. Wrong estimation of activity durations

Most of the workforce engaged in projects are form outside of the gulf and they are fully acclimatized to weather conditions of Dubai etc. summer can be very hot, and employees can be quickly exhausted resulting in slow work and little progress. This is usually one of the causes of lower efficiency and

productivity. Therefore, this aspect needs to be put into action in the planning phase itself and avoid setting up too rigid timings for completion of the designated tasks.

#### 2.9.10. Communication with the client

Unlike other countries the project environment in Dubai is quite complicated as clients exercise total control and power and frequent change orders are given. Project contractors are often at the mercy of the clients because of mood changes, design changes and changes in quality. As language is an issue when communicating with clients who are deemed to be too demanding, the same creates issues which alter becomes conflicts regarding payments and project drags on as consultant and the contractor slows down and drags the client to court and arbitration.

#### 2.9.11. Local Regulations and Customs

Most of the project contracts are still governed under the local sharia law and might be to the disadvantage for foreign consultants and contractors. Local customs are required to be understood fully to go ahead as planned and unless the same is done under Sharia rules project can be undergo delays and conflicts which requires intervention of arbitrators and can critically and negatively impact work progress. For convenience of the foreign contractors, consultants etc. however there is good news as English language courts have been established in Dubai and also special arbitration authorities can be involved for speedy disposal of the issues involved.

### 2.10 Resource Levelling

This is where the project managers use techniques such as Resource Leveling. If Resource leveling is explained it can be said that it's a technique in project management that overlooks resource allocation that helps in resolving the possible conflict arising from over-allocation. Whereas the project managers need to undertake a project, they need to plan their resources accordingly. Resource leveling would often help an organization to make the best use of the available resources and this also helps in the minimization of the wastes and eradicates the problem of over allocation of the scarce resources including skilled manpower. Project manager would have the duty of identifying what is the unused resource and must take steps to avoid unused and overallocation and reallocate the same resources for better end result. The process of resource levelling will benefit the organization without having to face conflicts and helps in the avoidance of delays on account of not having enough resources. This ultimately helps in the best resource management and increases the efficiency of the resource management within the project organization. As resource leveling would eliminate both under and

over allocation the same would also help in the avoidance of financial risk to a greater extent for a project team and would also reduce the escalation of project costs. There are many techniques which can be used for resource leveling and prominent among them are fast tracking and project crashing.

## 2.11 RISK MANAGEMENT

### 2.11.1 Risk Management Defined

Risk management can be defined as the processes which are undertaken by a project team to identify the risks which can reduce the efficiency of their project work, hinder progress and analyzing the same to take effective steps to neutralize their impact on the overall project goals and objectives. Risk Management is an essential function for any organization to identify the possible risks and take steps to mitigate the same in an objective manner. Threats however must be identified at the earliest and mitigated to make sure the business operations are not threatened by the risk components and the impact of such risk can be minimized. However, it must not be forgotten that risk is present in all what we do in every spheres of life and it can't be fully eliminated through our efforts. However, if the management is aware of the potential impact of such risks and its impact of the same can be minimized. Therefore, it is imperative that the risk management initiatives must be undertaken by most of the organizations to reduce negative impacts of many unwanted issues and problems. Some of these risks can be assessed before a project is even started and some of them would be encountered while undertaking the implementation of these projects (Thamhain, 2013).

When a project team is working on a long term and fast track project it is necessary to identify and anticipate some of the issues which can be expected to become bottlenecks in the implementation phase. If these risks are identified at the earliest then the risk team would find it easier to manage the same and in a manner which is efficient. Handling the risk in the desired manner only would be helpful in reducing their impact on the project in a negative manner and project teams might use one of the following ways to handle the risks involved:

#### 2.11.2 1.Avoid the Risk identified

The best thing that a project team can do is to avoid the risk altogether. By avoiding the risk if possible, the impact of the risk can be eliminated and without hurting the project in any manner. It is easiest to

think of, but the avoidance of the risk might not always be the safest and possible option. Thus, avoiding the risk might not be available in some projects (Jack R & Samuel J., 2006).

### 2.11.3 2.Mitigate the Risk Identified

If the Project team can't avoid the risk, then it must proceed to find methods and technology of mitigating the risk. Mitigation of risk involves taking some kind of action which would minimize the impact of the risk on the project work and progress and do-little damage to the prospects of the project being finished in time.

### 2.11.4 3.Transfer the Risk Identified

The other method possible for the project team to undertake is to transfer the risk identified to a third party and make a plan under which a third party will bear risk for the project team. One of the most common method of transferring risk is to buy the insurance for some risks identified but not always transfer of risks possible for the project team. Hence under those circumstances it must look at ways to mitigate or accept the risk (Ford & Randolph, 1992).

### 2.11.5 4.Accept the Risk Identified

The last possibility for a project team is to accept the risk fully and be prepared to face the consequence through efficient actions. Particularly if the risk can't be mitigated and transferred or avoided then the same must be accepted. The project team already knows what to expect if the risk occurs and remain prepared to face the same. If the risk can't be mitigated or avoided, then not much can be done, and impact has to be absorbed in some way or the other. This must be included in the project plan form the analysis stage and remain ready to face the same (Bateman & Majdalawieh, 2009).

## 2.12 Risk Management Framework

The Risk Management Framework (RMF) entails a process which looks forward to integrating a system which puts the onus on management of security and concerned management of risks involved in the project during its life cycle. The risk management framework involves the followings:

- a) Prepare adequately to meet contingencies
- b) Categorize each information processed and the risk identified.
- c) Select the process which needs to be managed for baseline security controls.

- d) Implement the controls within the organizational framework and deploy the system mandate reforms.
- e) Assess the development from time to time
- f) Authorize personnel to deal with deviations within their control environment.
- g) Monitor progress and deviations to make sure the processes are not beyond the control of the project organization.

The Risk management framework for a fast track project is visualized as shown in the diagram shown below:

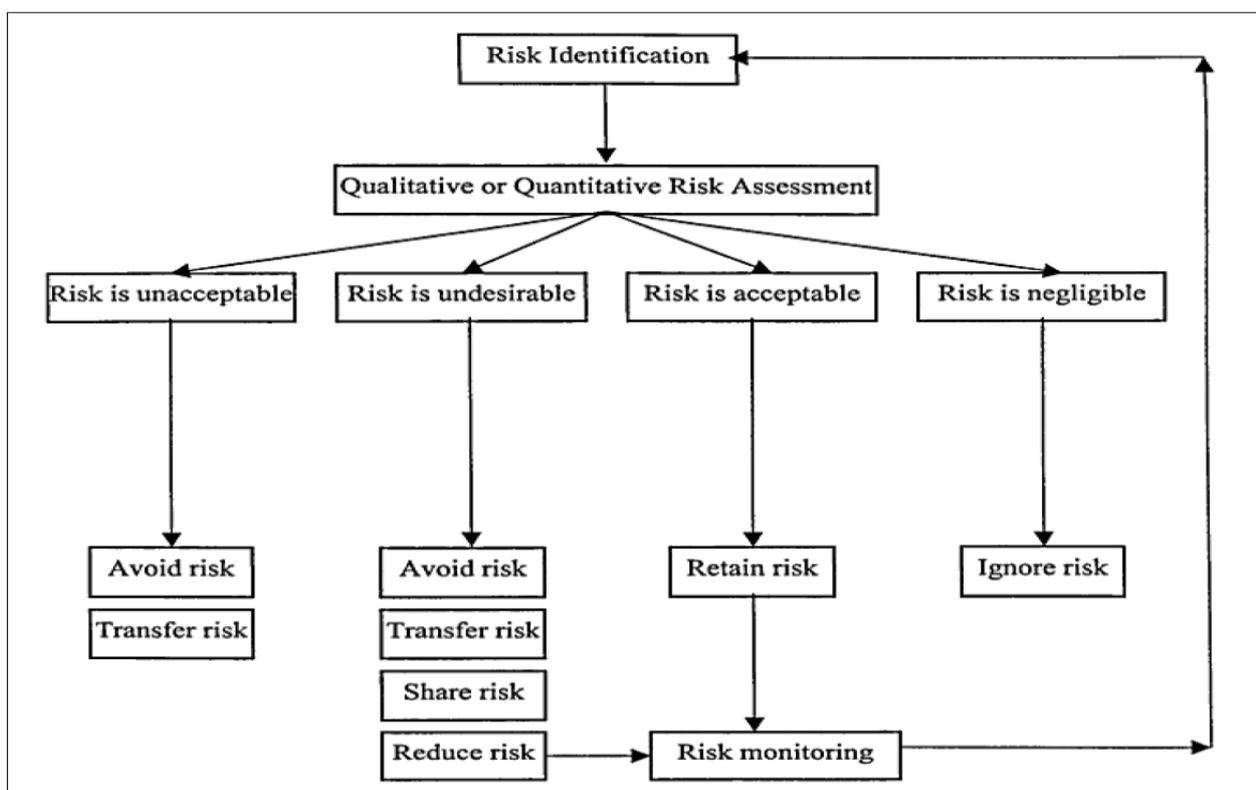


Figure 2: Risk Management Framework (RMF)

The above framework is just like a cyclical process in which the entire process starts with risk being identified and the identification is followed by either application of quantitative measures to measure the risk probability. Then the likely impact of the identified risk is estimated. The possible risk exposure is estimated to know the threshold of the risk acceptability. The next step involves risk response through risk transfer or risk mitigation etc. if following the mitigation of an existing risk a new risk arises, then the same steps are repeated.

## 2.13 FAST-TRACKING OF PROJECTS IN DUBAI

In the case of Dubai Many projects are fast tracked to meet the original deadlines. Some of them has tackled quality issues because of inability of the project management team and inexperience of dealing with the specific nature of these projects. However, in most of the cases fast tracking has helped the clients get the finished product in time and before inauguration schedule. Often the deadline was tight and fast tracking was sued midway because of slow progress. For this purpose, the current research dissertation would look into aspects of risk management practices for many of the Mega projects being undertaken in Dubai on a fast track basis to meet the deadlines like Dubai Expo pavilion and Al Maktoum International Airport (Barkley, 2004).

With a view to start business by 2020 and capitalize on the Mega Expo2020 many clients have been trying to fast track their projects, but the pressing issue remains that of being able to fast track all projects or a large no of projects. Fast tracking of projects which were originally not designed to be fast tracked can be disastrous as there would be design changes, quality changes, manpower needs would rise and particularly in the backdrop of shortage of skilled manpower and procurement delays projects would either miss their projected fast-tracked deadlines or the cost of the projects would increase significantly.

Fast tracking at the last moment is risky and not cost effective. If planned properly and ahead and from the beginning with establishment of realistic milestones incorporated then the fast tracking can be done and construction can run smoothly but if the same is brought in as a result of delays and slow progress hen the same might be disastrous as project teams might not be able to finish them under the older deadlines and older cost projections. And in fact, the fast tracking of existing projects is turning out to be too risky for many managers (Wang, Dulaimi, & Aguria, 2006).

## 2.14 Risk Versus Uncertainty in Fast Track projects

Even though there is a big difference in the risk and uncertainty, the same is often taken to be the same in risk management by many project team professionals. Here they shall be able to understand and differentiate the exact difference between risk and uncertainty involved in a project environment and particularly so in a fast track project in a place like Dubai where multiplicity of issues can potentially hinder the progress of a project.

### 2.14.1 Risk

A risk is an unplanned event, which if it occurs, might affect the project progress and goals negatively. The risk is positive if it affects your project positively, and a negative risk would affect the project in a

negative manner. Thus, it is essential to separate positive risks and negative risks and generally negative risk are in requirement of effective mitigation and treatment. One of the primary objectives of treating the risk which are perceived as negative risk is to lower the negative impact of these risks and make sure the projects objectives are achieved without too much delay and cost escalation. Risk can also be known in advance and for which responses can be planned in advance, but some risk can be unknown, and the same means project and risk manners must remain alert they neither know the risk not its impact. Unknown risk generally arises in the execution stage of the project and they were not capable of being identified in the identification process. For known risk a project risk team would often know to prepare a contingency plan and a contingency reserve can be prepared and used in this regard. But the unknown risks would be required to be managed through certain workarounds and the teams would need to use the management reserves for mitigating these risks effectively. The unknown and sudden risks are often found to be tricky and results in delays and loss of efficiency for a project including a fast track project as well (Barkley, 2004).

#### 2.14.2 Uncertainty

Unlike risks, uncertainty is the absence of certainty in doing or implementing some strategy and its results. In these cases, the outcomes are entirely unknown and project teams would have to make a guess which the best strategy is not. As there might be lack of information to certain extent, the results can be dangerous. However, uncertainty can't be treated like unknown risks. In the case of unknown risk, the background information is known, the risk can't be foreseen in the process of identification. However, in the case of Uncertainty, the team lacks the information entirely though the event is identified (Uher & Toakley, 2000).

#### 2.14.3 Difference Between Risk and Uncertainty

The subtle differences are summarized as follows:

- a) In the case of a risk, the outcome can be predicted but in the case of uncertainty the outcome won't be predicted because of lack of information.
- b) Risk can be controlled through appropriate mitigation measures, but uncertainty is mostly uncontrollable as its scale and effect is not ascertained.
- c) Risk can be measured by the risk team, but the uncertainty can't be fully assessed or quantified.
- d) A probability can be assigned to risk events once it is known and, but possibilities and probabilities can't be assigned to uncertain events as nothing is known regarding the same to the project teams.

#### 2.14.4 Managing Risk and Uncertainty

Risk management is easier when compared to uncertainty management. This is because risk can be identified, and impact can be ascertained so that the project team is prepared to deal with the same. Contingency measures can be prepared to tackle its negative impact. However, managing uncertainty is difficult because not much is known about the same and contingency measures can't be undertaken. Only thing that the management can do is to make team remain alert. Uncertainties are difficult to mitigate because there can be too many parameters and it can't be done with certainty as to which parameter would affect the outcomes. Thus, outcomes can't be predicted with certainty and hence the teams would be on tenterhooks all the time. However, it must be kept in mind that even though concrete steps can't be taken to fight uncertainty, the project team must be very cautious, proactive, and open-minded to manage risk and uncertainty (Wang, Dulaimi, & Aguria, 2006).

### 2.15 Internal Versus External Risks in Construction Projects

Risks can come from factors that are outside the team or project scope and the company or they can come from within as well. These risks need to be identified and classified so that the project can continue without being adversely affected.

#### 2.15.1 Internal Risks

Project managers have the responsibility of identifying and prioritizing the risks which are internal to the specific project environment. Internal risks can be financial, manpower related or technology oriented. Often internal risk arises from ability of the company to have adequate resources to finish the project. Skill of the managers involved in the project is also an internal risk which needs to be handled delicately. Internal risk can also arise from the absence of personnel caused by sickness, leave and absence of or unavailability of equipment's, IT servers and software glitches etc. For fast track projects software issues can be often found to be negatively impacting the outcome in a big manner. The availability of the equipment's and these internal risks related to manpower can be location specific and thus need careful consideration to manage them from impacting the outcome too negatively (Watson, 2005).

#### 2.15.2 External Risks

External risks are those risk which falls outside the purview of the project environment and that of the organization and is generally outside the control of the project team. For example, if the main supplier

or the contractor of a fast track project goes bankrupt then the same would create huge problems in the implementation of the project. However not much the Project team or the project organization can do about the same. It can't be controlled or mitigated, and the project team would have to undertake alternative programs to counter the pitfall.

External risk threatens the project and often found to be taking the project managers by surprise for the turn of the events and some of them can be deficient in not analyzing the external threats fully. To be able to counter such drastic risk which derail the entire project and unravel misery, project teams needs to be alert and remain circumspect. This is where it is quite needful for the project team to have assembled a team form as much diverse background as necessary. Brainstorming on a regular basis can also be quite critical for the teams to be able to effectively counter such risks. By creating an environment which is found to be conducive for effective brainstorming, the project team members would be comfortable with sharing their knowledge and the free expression of thoughts and the same would be directly leading to the full examination of the risks (internal and external) involved (Larson, Gray, & Desai, 2016).

It must be remembered that while the internal risk is easier to mitigate and manage, it is highly necessary for the risk managers to concentrate on both types of risks to make sure the project is successfully complete the project in time and within the allocated resources. Accurately assessing the risks is an essential to the effective mitigation of the risk involved in fast track projects as delays could be catastrophic.

For effective management of the both kinds of risks in a fast track project, it is highly essential that a risk breakdown structure is put in place after the appropriate risk are identified. Through this risk breakdown structure the risk can be assigned to specific parts of the project and then only the relationships between the sources of risks and project elements can be evaluated properly to be accounted for in the project plan (Kangari, 2009).

## 2.16 Process of Risk Management

Managing Risk in a project is often tricky and cumbersome process if the Risk managers do not adopt the proper risk management plan. Risk management calls for an integrated process of delineating specific areas or risk and then continue developing a comprehensive plan and also take steps to integrate the plan with the overall project plan and conduct a continuous and ongoing evaluation.

The Process of Risk Management includes the following steps:

### 1) Establish the context

Establishing the context means the Project team for a fast track project would need to map out the scope of the remainder of the processes and identify the basis on which the probable risks would be analyzed, and mitigation exercise would be undertaken.

### 2) Identification

After the establishment of the proper context in which the Risks are required to be established, the next logical step is to identify the possible risks which might cause problems in the implementation of the fast tracking. Risk identification in this case must begin with the source of the problems and or with the problem itself.

Identifying the risks would require knowledge of the organization, the country of operation and the market, the ongoing economic and political situation and general business environment. The financial ability of the organization and how capable it is to face unplanned losses is also quite important. Inability to identify possible risks in time might lead to severe stagnation later. Identification of the risks which might be involved in the process would mean the foundation of the risk management is put in place and the same would allow the risk mitigation processes to be analyzed and finalized.

### 3) Assessment

Once risks have been identified the next step is to analyze the risks in detail, analyze the probable negative effects and the probability of occurrence of the risks. This process involves analyzing the risk and making an educated guess as to how much they are likely to cause disruptions to the ongoing fast track project. However, the issue here is that of non-availability of statistical information which would make it impossible for the project team members to make the proper assessment of the probability of occurrence. Evaluating the severity of the consequences (Impact) is often quite difficult for immaterial assets. Asset valuation is another question that needs to be addressed well by the Risk managers as well (Damodaran, 2007).

### 4) Potential Risk Treatment

Risk treatments can take the form of the following four forms and each of which was discussed earlier:

- a) Risk Transfer
- b) Risk Mitigation
- c) Risk Avoidance

#### d) Risk Acceptance

However, each of these options must be considered with detail by the Risk manager team and the same must be analyzed with the relevant Project Teams to finalize the best course of action.

#### 5) Creating the Plan

The next logical step is to decide on the combination of methods to be used for each risk identified and analyzed. Each risk management decision at this stage must be recorded and it shall also be required to be approved by the Project team in charge of the risk mitigation process and in some cases it shall also be approved with specific approval from the Board of directors and the client as well. A better Risk management plan shall be capable of identifying the schedule of control for the implementation of the plan and also the people who are in the charge of the implementation as well (Alithey, 2015).

#### 6) Implementing the Plan

The most critical part of this entire process is to implement the plan well and reduce the negative effect of these identified risks. Insurance can be purchased if required. Experts can be engaged when mitigation is the need and plans be put in place with technologically approved measures. Thus implementation of the plan is critical as the same being done well would mean that risks and their effects can be avoided in totality or partially without sacrificing too much resources to achieve the goals and objectives of the project (Clifford F. Gary, 2008).

#### 7) Review and Evaluate Plan and results

Initial risk management plans will never be perfect. Thus, the plans must be reviewed at intervals to better the same. If the initial plans are not yielding the desired results and deviations are too much to the liking of the project team then the risk team must focus on changing and modifying the plan. More information shall be generated with a view of managing the risk plan better and making the plans which can bring positive changes. Therefore, the Risk analysis results and the plans must be continuously updated at periodical intervals for better mitigation of the same.

### 2.17 Risks Involved in Fast Tracking of Projects

Poor risk management in construction and infrastructure development is a direct consequence of inadequate recognition of the risk involved and not responding to the risks which are identified and the same can be devastating for a number of projects. Positive changes can be made to risky projects if the

risk involved are identified in time, analyzed in detail and mitigation measures are initiated and observed and modified to get to the goals with limited variation in cost and quality terms (Akintoye, Goulding, & Zawdie, Construction innovation and process improvement., 2010).

Various risks associated with Fast track projects are discussed as shown below:

<b>Risk</b>	<b>Nature</b>	<b>Probability</b>	<b>Impact</b>	<b>Risk Score</b>
Risk Emanating from Owners	Risk of non-payment by Owner to contractors	4	6	24
	Owners intervene improperly	3	7	21
	Frequent change of design	3	6	18
	breach of contracts with contractors	3	5	15
	Owners' disputes with contractors			
Design Risk	Defective designs approved	6	4	24
	Frequent changes of design by designers	7	2	14
Risk (contractor side)	Poor quality labor	6	3	18
	Low productivity of equipment	5	4	20
	Incompetent workforce in contractor organization	4	5	20
	Incompetence of contractor	6	3	18
Suppliers Risk	Non-timely supply	5	4	20
	Defective and poor-quality supplies	6	3	18
Economic factors	Increase in inflation and general cost factors	6	3	18
	Manpower non-availability	5	4	20
	Non-Availability of Technology	4	5	20
	Lack of quality Materials	6	3	18

Environment and natural factors	Negative weather conditions	5	4	20
	Unforeseen site conditions	6	3	18
Social and other factors	Unfair Tendering process	6	3	18
	Lack of Proper Arbitration facilities	5	4	20
	Delays in resolving contractual issues	4	5	20

## Chapter 3: Research Methodology

### 3.1 Introduction

Many previous researches were undertaken with respect to fast track projects with numerous case studies and qualitative research was undertaken. However, the quantitative research aspect of the fast track projects was lacking in general except a few scholars who undertook research with the help of statistical tools. All these researches undertaken previously helped in the understanding of the benefits that have accrued from these fast track projects and also how the project managers were able to undertake effective management of risk which emerged out of fast tracking of projects. It has slowly and steadily emerged that many projects are now days fast tracked and more so in the case of Dubai and UAE as multitude giant projects are being implemented on a war footing. As per research made by (Demkin, 2008), it is highly essential to study fast track projects on a specific market basis. This current research aims to study the fast track projects being implemented in UAE and would strive to identify the methods which are being employed to efficiently manage and complete the fast track projects in UAE.

The previous chapter (Literature Review) synthesized the literature on risk management process involved in fast-track projects. The literature review and the data discussed would be helpful in getting to know which methods would be more useful for data collection and data analysis. A survey questionnaire is prepared and also a focus group discussion is being applied for efficient data collection and deciding as to which methods would be applied to find reasonable and meaningful conclusions. Adequate steps are being undertaken to ensure the data collected is reliable and valid for the purpose. Further there would efforts to make sure the challenges faced in analysis of the data collected and other ethical perspectives are also looked into while undertaking this research (Crotty, 2008).

### 3.2 Scope of the Research

The scope of the current research is limited to fast track projects in UAE. However, it might be noted that the specific data regarding collection of data is very sparse in UAE and thus data is being collected from construction companies from local and international sphere who are either working in UAE or previously worked in UAE. How the risk was encountered by construction companies, which particular risk were perceived to be more dangerous and difficult to handle and which methods were applied by

project managers to tackle the risk effectively are crux of the research. It would also be seen and discussed if the measures which were undertaken previously are going to be effective in today's environment or more and more modifications would be needed to make them effective.

### 3.3 Research Design

The research designs refer to the research framework which is used for dissecting a research problem and purpose of the research can be of many types including of exploratory nature or descriptive or experimental. Research can also be exploratory or even be interpretive as well. Generally, the strategy of the research would mainly depend upon the kind of questions being enquired into and the overall research design designs on the research problem. As the current research involves question which begins with what kind of problems , it is decided to use a survey strategy and the same strategy entails using instruments like a questionnaire being prepared and distributed among the selected audience to get the desired results and summarize and analyze them to find the possible answers to the questions being asked and looked into (Creswell J. W., 2009).

### 3.4 Research Paradigms

The research paradigm is related to the methods that is more likely to be adopted for framing the research issues and collection of data for further analysis. Research paradigm can be either a qualitative paradigm or quantitative one. In many cases as with the current research there is a likelihood that the researcher includes all the two and make it a cohesive one based on both qualitative aspects and quantitative one.

#### 3.4.1 Quantitative Paradigm

The quantitative approach to research is seen to focus more on the evaluation of the numerical variables and data which has bene collected through appropriate data collection method. This kind of research is more useful for finding an appropriate level of comparison between the findings of the previous researches made in the same set of parameters and also the current one. Quantitative properties can only be examined using quantitative research method with one or more than one statistical and mathematical testing being undertaken. The quantitative research is solely based on empirical data and its further analysis, through employing of statistical tools and comparing the same to others. For collecting the empirical data for this research, the emphasis is put on structuring the questionnaire in the right way and putting the same data to testing with appropriate statistical tools (Kothari, 2013).

### 3.4.2 Qualitative Paradigm

The qualitative approach to research is seen to focus more on the evaluation of the non-numerical variables and data and make an effective comparison to reach reasonable conclusions. Qualitative analysis involves collection of data from a variety of sources, literature and earlier researches done and opinions of scholars and skilled people involved in the research field category. In other words, the researcher investigates the definitions, meanings and characteristics of an activity or an object as observed by the subject. The qualitative paradigm helps in employing various methods for collecting and analyzing data such as focus groups, observation, ethnography, in-depth interviews etc. In this current study the primary emphasis is given to qualitative responses provided by the respondents to the open-ended questionnaire sent to them. Under this view however instead of just ticking from given choices some of the questions would ask the respondents to provide a detailed view of the matter as per their expertise and level of understanding. Then the same would be compared to existing study literature and opinions of earlier researches done by scholars etc. (Denzin & Lincoln, 2005).

### 3.4.3 Mixed-method Paradigm (what is adopted)

Most researchers often choose to have both qualitative paradigm and quantitative paradigm built into their researches. This is because most of the researches come up with both numerical data and non-numerical data for their analysis. If the variables and the data is both types and one can't be totally omitted then it is paramount to have mixed research paradigm to include both qualitative and quantitative methods and the current research is making an attempt to have both methods included for data collection and data analysis (Bryman, 2012).

### 3.4.5 Data Collection

Risk management itself is a very broad category in terms of construction management and fast track category is quite complicated. Therefore, the review of the relevant literature in such a key case is quite important to know the key parameters and understand the important concepts involved in risk management of the fast tracking of projects. For knowing these details, a major literature review was conducted, and concepts and importance were identified. Key concepts and parameters were identified so that analysis can be undertaken on the same basis and a comparison can be made as well to provide adequate recommendations for effective risk management in new fast track projects. The primary aim of the research is to identify the methods which can be used to mitigate risk effectively and those which were used earlier would be identified to be successfully implemented in new and existing projects (Bateman & Majdalawieh, 2009).

### 3.4.6 Designing of Survey Questionnaire

The literature review done earlier was used to collect the secondary data and formulation of the key concepts and parameters for making comparable analysis. However, all of the primary data was collected through the survey questionnaire prepared for collecting responses from the respondents who were selected for this survey. The Research analysis is aiming to make sure of the mixed method (which consists of both qualitative methods and quantitative methods) to bring the required data and previous knowledge in to analysis. The survey is conducted after the secondary research such as the review of the literature is done, and concepts and frameworks and parameters were duly identified and noted. The questionnaire is designed as a power tool for collecting the relevant data and including adequate number of respondents to be part of the data collection exercise. As the data collected would be extensively used, enough attention is sued to formulate the questions, develop the whole format and implement it to suit the respondents to fill the questionnaire with minimal effort.

As the current research involves question which begins with what kind of problems, it is decided to use a survey strategy and the same strategy entails using instruments like a questionnaire being prepared and distributed among the selected audience to get the desired results and summarize and analyze them to find the possible answers to the questions being asked and looked into (Creswell J. W., 2009). In this research paper, it was decided to employ questionnaires to explore the phenomenon of fast-track projects in the UAE. As per the aim was to compile an accurate profile of developments in this emerging area, a descriptive design was chosen as the most suitable.

Closed questions are also used under which the respondents were asked to choose out of the options provided to enable the investigating team to gather as mush precise data as required without having to undergo too much variations. Ass there is always a danger of getting stale data, wrong data or factually misstatements, there is a number of open-ended questions in the questionnaire to enable the respondents to provide an in-depth view of the issue and the problems being raised. This is expected to get some subjective answers which can be helpful in validating the views and opinions expressed and found in the literature review. Most of the question which were included in the questionnaire is aimed at providing general comments regarding risk seen to be arising in the fast track projects and which as part of some kind of organizations in the project sphere each participant has undergone in the past and effectively implementing an active strategy developed to deal with each risk unique to a fast track project.

### 3.4.7 Population and Sampling

The Data Analysis would be based on the samples which were collected through distribution of the questionnaires to the 30 respondents. The respondents who would be included in the questionnaire are chosen from the construction industry and was either working with contractors in large construction project or with sub-contractors etc. most of the respondents who are chosen for this questionnaire are those who has earlier experienced some kind of the risk emanating from fast tracking projects and actively took part in the risk management process activated by their respective organizations. Some of the respondents were also owners of the fast-tracked projects in UAE. Risk arising in such projects can be of a wide-ranging category and which if not treated efficiently in some would jeopardize the project and increase the financing needs to and damaging extent. The respondents who took part in this data collection exercise were known to have worked in good positions in the projects at some point of time and because of that they are in a good position to explain how these risks of various nature could impact negatively their projects. Most of these risks are believed to be external factors and hence there are opinions that they would need immediate and adequate risk mitigation procedure to mitigate these risks very effectively and efficiently (Remington & Pollack, 2007).

### 3.4.8. Ethical Considerations in Research

In every research, there is required to be some kind of care for undertaking the research in a manner which can be called ethical. Ethics is related to open-mindedness, honest about what is being included in the research and specifically not including data which might be bogus. The respondents were clearly told about the purpose of the research and if they wish they were given the option of withdrawing from the survey. Consent was taken from each of the respondents before they were sent the questionnaire for filling up. Data obtained from them (the respondents) were promised to be kept confidential and participation of the respondents would be kept anonymous for all practical purpose (Russell & Ranasinghe, 2010).

## Chapter 4: Data Analysis

### 4.1 Introduction

The analysis of the results chapter is created to present the analysis that would be done on the basis of the data collected through questionnaires. It would include both primary sure of data which was gathered out of the Questionnaire distributed and the literature review (secondary data). The Analysis would be beginning with profiling of the respondents who were participated and included in the research and their experience in working with fast track projects. Afterwards the responses gathered form the respondents would be analyzed by categorizing the questionnaire answers. The data so gathered would also be sued to carry out necessary statistical tools and hypothesis to fully understand the probabilities associated with various risks and ranking of the critical risk. It would also be made a priority to propose a valid risk management and mitigation framework for effective dissemination of the risks arising out of the fast track projects in UAE (Bryman, 2012).

### 4.2 Type of Companies Respondents Worked For

The 30 respondents who participated in the survey were asked to classify their companies on the basis of their origin and it worked out as shown in the following table.

Table 5.1: type pf construction company's respondents worked for

	No of respondents	% of respondents
Domestic Companies in UAE	15	50%
International companies	3	10%
Government Companies	7	23.33%
Private Sector Local	5	16.66%
		100%

As can be seen from the above schedule the largest no of respondents worked in UAE domestic companies. these companies were also found to have worked extensively in large infra projects and some of them even have big projects outside of UAE. While government companies were 23.33% of

all the companies, international companies taking fast track projects in UAE were found to be the lowest among 4 different categories working out to be only 10%.

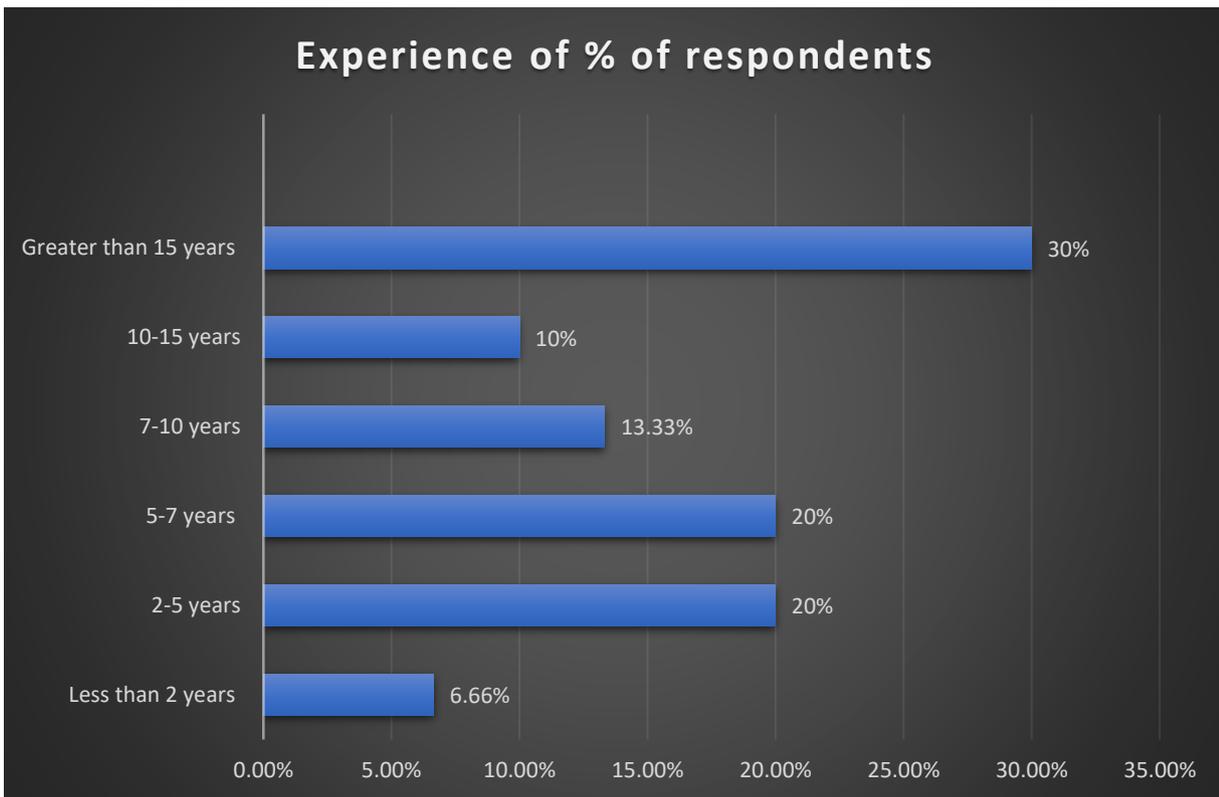
### 4.3 Experience of the Respondents

When asked about the kind of role the respondents played in the construction companies undertaking fast tracking projects and the duration they have effectively spent in these roles, it has worked out that the average no of years they worked in the fast track projects in more than 6-7 years. Also, a large no of respondents worked in projects which were having budgets in excess of USD 1 billion. The experience of the respondents and the budget of their project is presented in the following table as shown below:

**Table 5.2: Experience of respondents in working with fast track projects**

Years of Experience	Respondents	
	No of respondents	% of respondents
Less than 2 years	2	6.66%
2-5 years	6	20%
5-7 years	6	20%
7-10 years	4	13.33%
10-15 years	3	10%
Greater than 15 years	9	30%
	30	100%

As can be seen from the above table approximately 30% of all the respondents had an experience of greater than 15 years in organizations of repute working in fast track projects. Another 23.33% of the all the respondents had an experience of greater than 7 but less than 10 years in organizations of repute working in fast track projects. While 20% of the respondents had an experience of 2-5 years in such projects, approximately 20% had experience of 5-7 years. Only 6.66% of the respondents has an experience of working in fast track projects for 2 years or less. This means the mix of the respondents is quite good as the most of these respondents had about more than 5 years of experience in working in the UAE fast track projects and that makes them good candidates to have understood issues and risk that creep up in such projects and have participated in risk mitigation measures being undertaken by their respective organizations (Cortinhas, 2013). The same is presented as follows:



**Figure 5.1:** Experience of Respondents who participated in Survey

#### 4.4 Projects divided on the basis of Budgets allocated

The query regarding the budgets of the projects they have worked upon has resulted in the following response and they were summarized as follows:

**Table 5.3:** Budgetary allocation of fast track projects

Average Budget	Respondents	
	No of projects	% of Projects
Less than \$500mn	10	33.33%
500mn-\$1bn	9	20%
\$1-\$2bn	5	16.66%
\$2bn-\$3bn	3	10%
Greater than \$3bn	3	10%
	30	100%

As seen from the above table a majority of the projects have a budget of less than 1 billion USD. While approximately 33.33% of the budgets were made of a budget of less than \$500mn , another 20% of the projects were provided with a budget of approx. \$1 billion. This means 53.33% of the projects these respondents have worked upon had a budget of approx. \$1bn or less. The average price of these projects taken together worked out to be approx. \$650 million. While only 10% of the projects were having a budget of \$2-3 billion, only 10% of the projects were allocated a budget of \$3b or more. At the same time a 16.66% of the projects were allocated a budget of \$1-2 billion. The Average budget for all the projects in the range of \$1 billion or more worked out to be \$1.5 billion approx. This means most of the projects which were fast tracked in UAE were larger projects and which emended specialist contractors, designers and were also expected to add to the UAE GDP in a very significant manner (Fernandes, 2014).

#### 4.5 Roles played by Respondents

It was further analyzed that the roles played by the respondents in the fast track projects of UAE have bene quite contrasting in nature and it is anticipated that the issues they faced in their respective areas of expertise also differed significantly.

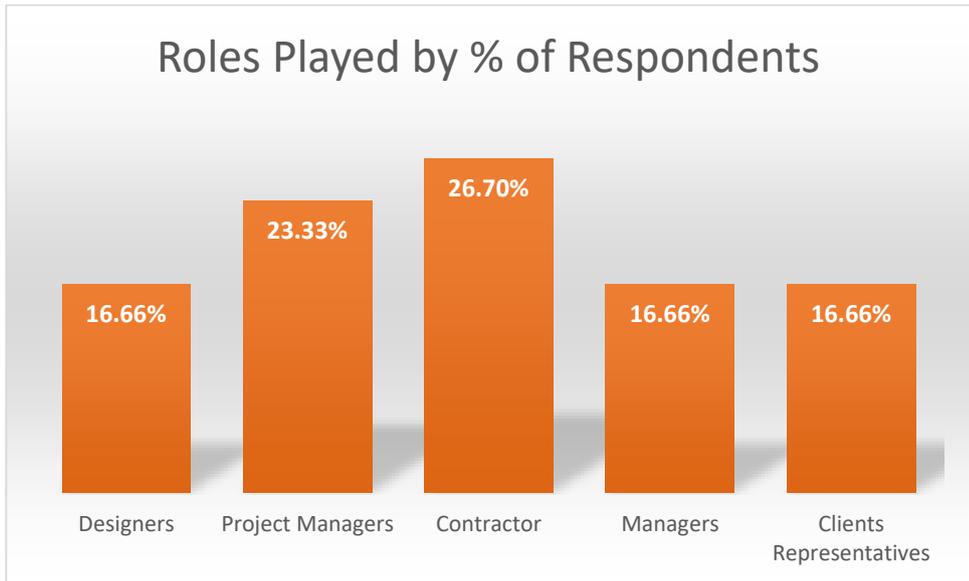
**Table 5.4:** Roles played by respondents in their respective projects

ROLE PLAYED		
	No of Respondents	% of Respondents
Designers	5	16.66%
Project Managers	7	23.33%
Contractor	8	26.7%
Managers	5	16.66%
Clients Representatives	5	16.66%
	30	100%

As can be seen form the above schedule the most no of respondents were contractors in fast track projects amounting to 26.7%. 23.33% of the respondents played the role of project managers who oversaw the project implementation and hence remained in the charge of managing the whole projects. 16.66% of the respondents played the role of managers who worked under the supervision of the project managers and were put in charge specific charge of construction or procurement or human resources and technology etc. Another 16.66% of the respondents were working in these projects as the client's representatives and worked closely with the project team and the project managers and played active roles in the overall progress and implementation of the project. They reported to the project owners in their capacity. A further 16.66% of the respondents played the role of designers who were in charge of

designing of the project and has to work round the clock for making necessary changes as a result of risk or design changes which were necessitated on behalf of the clients or project owners (healey, 2015).

The same is presented in the following diagram as well:



**Figure 5.2:** Roles played by the Respondents who participated in Survey

#### 4.6 Amount (number) of Fast track projects undertaken by the Respondents and their organizations

The participants of the survey were asked about the no of fast track projects they were part of or how many no of projects their organization undertaken to implement in the last 5-10 years and the result is summarized in the following table as shown below:

Table 5:5: Number of fast-track projects undertaken by respondent’s entity

No. of fast tract projects	Frequency
1-5	5
5-10	12
10-20	7
20-30	5
Greater than 30	1

It can be seen that most organizations have undertaken to implement fast track projects in the last 5-10 years. While 5 companies were seen to have undertaken 1-5 projects, 12 companies undertook 5-10 such projects. 30 small scale fast tack projects were undertaken by 1 company only. This shows that a no of projects were fast tracked in UAE as the same were done to integrate the finished project with the economy sooner and clients were eager to get the projects completed in record time frame. At the same time it was also asked to the same set of respondents to tell if their entities are planning to undertake new fast track projects in the coming few years and the following figures were reveled through the same (Peck, Olsen, & Devore, 2016).

Table 5.6: Number of new fast-track projects in the pipeline

No. of fast tract projects	Frequency
1-5	10
5-10	7
10-20	7
20-30	5
Greater than 30	1

As can be seen from the above table a large no of projects is likely to be undertaken or taken up by the entities of the respondents in the coming few years. 7 organizations were having 5-10 fast tracking projects in the pipeline and another 7 have 10-20 projects in the pipeline. However only 1 entity is known to have 30 different projects pipelined to be implemented in the next few years. This shows that the fast track method of the project implementation is gathering steam and is quite popular mode of project management in UAE.

#### 4.7 Knowledge and participation in Risk management process of their Fast track projects

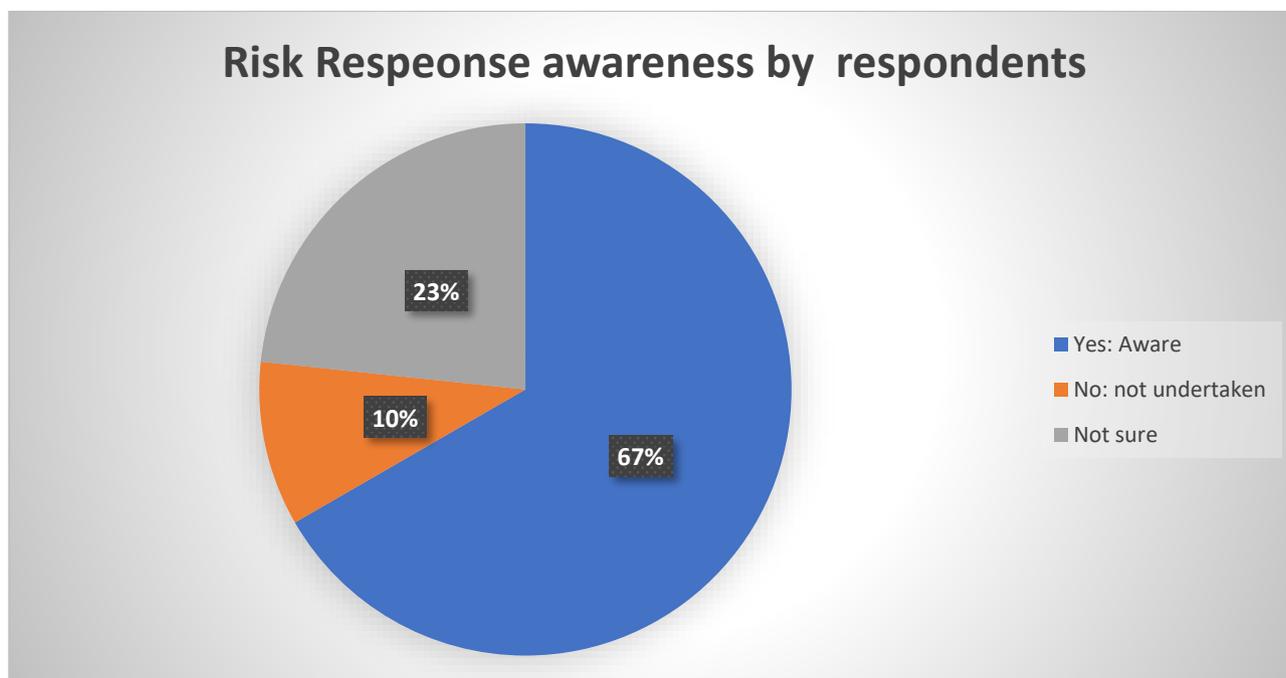
All the respondents were asked if they have participated in any possible risk management process related to their fast track projects or even when they were not participants in such processes, they were aware of the risk management processes being undertaken by the project management team. The responses were classified and shown in the following table:

Table 5.7: General implementation of risk management in fast track projects

	No of respondents	% of respondents
Yes: Aware	20	66.66%

No: not undertaken	3	10%
Not sure	7	23.33%
	30	100%

As can be seen from the above schedule a majority of the fast track projects undertook risk management processes to deal with uncertainties arising out of a variety of risks related to their projects. 66.67% of the respondents were of the opinion that they were either made to work on risk response process related to their area or they were aware of risk processes being undertaken to quell the effect of these risks. 10% of the respondents were of the opinion that risk management processes were not undertaken by their respective organizations. The remaining 23.33% of the 30 respondents were unable to specify if any risk response measures were initiated or not and in many cases, it was told that they might not have heard of such measures because they were implemented as part of the initial planning processes. The same is presented in the following chart:



**Figure 5.3:** Risk response awareness

The study revealed that 2/3<sup>rd</sup> of the professionals who participated in the survey were those who worked in the implementation of a risk management process. Either they were involved directly, or their feedback was taken for finalizing the risk process overall. While 3 respondents or 10% were not aware of any such process (they did not participate in any such process) , 23.33% of all the professionals were not sure if there was any such specific fast track oriented risk management process at all.

#### 4.8 Association between perceived necessity of risk management and general implementation

A test was conducted to see if there is a direct perception between the necessity for a risk management process in fast track project and their general implementation by the respective Risk management and the project team.

**Null Hypothesis (H<sub>0</sub>):** There is the presence of a statistically significant relationship between the between the perceived necessity of risk management and its general implementation of the risk management process and framework in the in fast track construction projects in UAE.

**Alternative Hypothesis (H<sub>A</sub>):** There is the presence of not a statistically significant relationship between the between the perceived necessity of risk management and its general implementation of the risk management process and framework in the in fast track construction projects in UAE.

The following results were obtained from the chi-square test undertaken for the same and is presented as follows:

Chi Square Test								
Is it necessary to implement risk management in construction projects?								
	Actual Results				Expected Results			
	Yes	No	Not sure	Total	Yes	No	Not sure	Total
Yes	17	2	2	21	14	3.5	3.5	21
No	1	1	2	4	2.666667	0.666667	0.666667	4
Not sure	2	2	1	5	3.333333	0.833333	0.833333	5
	20	5	5	30	20	5	5	30
Chi	0.091447							
Df	4							
p	0.0003							

The chi-square test yielded a chi-square value of  $\chi^2(4) = .091447$  and  $p = .0003$ . Since the p value of .0003 is less than 0.05, (the null hypothesis is accepted and hence) there is a statistically significant association between the perceived necessity of risk management and its general implementation of the risk management process and framework in the in fast track construction projects in UAE (Fernandes, 2014).

#### 4.9 Construction Workers' Knowledge of Risk Management Concepts

It was essential for the people who work in fast track projects to completely understand the issues which threaten to slow down the fast track projects and disrupt the progress thereby throwing uncertainty in

the path. However, a majority of the respondents were of the opinion that most of the sectoral employees clearly understood the impact of the possible risks and participated in a process to identify the root cause of the risk. A vast proportion of the employees engaged in construction industry opined that risk management is an integral process of fast track project success and hence advocated the risk management to be made mandatory for most fast track projects. In general, there was an opinion that most of the people who worked in the fast track projects have already worked with normal projects a hence already have developed an intricate understanding of the issues involved and risk management process and hence don't find themselves out of sync when they were confronted by new risks which were emerging out of fast track projects. Most of the respondents were also of the opinion that while a general perception of risk on the part of the construction sector employees were technical nature, the same for the clients or owner's perspective is that of financial in nature. This means the owner of the project viewed the risk arising as a financial issue which in many cases hampered the application of the risk management framework for a particular fast track project or at least delayed the same. The same perception was proved in the previous hypothesis which established the fact that most respondent's ad employees believed that there lies a general belief that better risk management in fast track projects amounts to better management of the project and overall success of a given project.

#### 4.10 Risk categorization in UAE companies undertaking fast tracking Project

Risks can be generated from within the company or from outside as well. So, risk can either be internal or they can be external as well. Internal risk is those risk which are specific to a company or specific to the project being implemented. As a result of the risk being specifically related, the same belongs to the project management team and must be treated by the project team. These risks can arise from the owners of the project or contractors or from the designers etc. thus it might be easier for the project team to track them and treat them quicker.

External risks are however falling outside as they were generally caused by external factors. Factors such as recessionary conditions prevailing in the market, economic phases prevailing, government brining new regulation etc. are example on which the project team management would not have any control. There can be risk emanating from accidents, natural calamities etc. as well. International construction companies often face risks which are generated from changes in the domestic business environment as well as changes in the international business environment. Hence different companies can possibly face different challenges in the same environment and they would need to treat them differently as well.

#### 4.11 Risk ownership and Allocation in UAE Fast Tracking Projects

It's not possible to implement and complete a construction project on a fast track basis without encountering some kind of risks and hence it becomes essential to make sure the risks which are encountered are either treated by the project team or minimized or shared with a third party or transferred to the third party. The overall success of the project depends upon how the project team management allocates the risk identified to minimize or eliminate its risk. Some of the analysts like advice and recommend that some of the risk which can end up increasing the cost of the project (cost overruns) must be shared among different parties involved (contracting parties) in an manner or ratio which might be acceptable to both. So, some of the risk can be borne by the owner and some part by the project team or the contractor (Makui, Mahdavi, & Farrokhian, 2009).

(El-Sayegh S. , Risk assessment and allocation in the UAE construction industry., 2008) undertook a study of the construction companies in UAE and came to the conclusion that UAE construction companies worked in a certain manner in which a larger proportion of the risks were pushed over to the contractor. The method is quite common in the design and build contracts in which the contractor involved is given the full responsibility of the project and hence undertakes full responsibility and risk involved. The responsibility is undertaken as the contract comes with a lump sum value or the price is predetermined with very little or no possibility for being compensated for possible risk. The owner or the client company negotiates a final price for the work with the contractor even in the full knowledge that the contractor might involve several sub-contractors in the project and has proved to be one of the most popular method of project implementation in UAE construction industry. Here the most important aspect is the fact that all the risks are transferred by the owner of the project to the contractor who agrees to assume the full risk responsibilities (Creswell J. , 2009).

Some of the researchers like have in the past warned that if the allocation of risk is found to be improper then there is a greater degree of dispute and avoidable claim in the future resulting in delays and loss of quality. They were of the opinions that if the risk allocation is good and defined among various parties included then the risk management process is likely to be sharp and risk allocation and ownership of risk is defined as well which would lead to less delays and timely completion and execution of the project (Rahman & Kumaraswamy, 2002).

#### 4.12 Risk Identification and Levels of Risks in UAE's Construction Industry (Risk management Framework)

Traditionally, contracting for a project involved a general contractor and the projects designer and the contractor is awarded with the contract with the value of the contract pre-decided. Once the bid is

accepted and the terms are agreed along with the pricing, the contract would be expected to be executed on a linear basis and the owner of the project would use the services of the designer to keep a tab on the project progress and quality. This model of traditional contracting is termed highly beneficial for the owner.

Firstly, the owner has full control over the design of the project, and they use the services of the designer to monitor the project in terms of design and quality of the work intended. The designer of the project often turns out to be the eye for the owner and has to co-ordinate with the contractor and the project team.

Secondly, the owner would be required to deal with only one contractor and even though the work might be subcontracted ( it would be done by the contractor) , the owner has no duty and responsibility to manage these sub-contractors and suppliers of materials and manpower etc. this allowed the owner to remain independent of any risk that the contractor would face in the implementation stage except to manage legal work related to the site and all government paperwork etc.

Thirdly, the owner of the project also assured of the probable value or price it has pay the contractor as the price is pre-determined in advance and unless exceptional circumstances arise, the price is hardly negotiable in many contracts. So once a competitive bidding was accepted, the financial risk is transferred entirely to the contractor and the owner is free of any further liabilities and cost overruns.

However, these traditional contracting features were successful where the scope of the projects are fully understood and clearly defined. The designs of these projects were needed to be made without errors and the targets under the project were clearly achievable within the specified targets. However, in modern times most of the projects (mostly large projects) have become so much advanced technologically that there is always a scope for improvement and design changes are necessary even after the project is started. Technological changes and non-availability of new technology is also quite responsible for design changes multiple times. As a result of these changes and to include new technical issues as they become available, it is hard to manage flexible projects within a specified budget. For example, a project which has been approved in 2012 and needed to be completed by 2019 and has undergone several changes in both design and technological requirements would need huge cost escalations and it would be impossible to complete such projects under traditional contracting methods where prices are mostly fixed (Kartam & Al-Daihani, 2009).

These forces of changes over the years have brought about a sea change in the no of risks and the level of risks as experienced in the construction industry by fast track projects. Fast track project can't be expected to be delayed by non-progress and staling of activities through denial or licenses etc. the new types of contracts are either cyclical or a set of interdependent contracts and a general failure to manage the new type of risk arising out of such contracts are key to the success of the project within the given

deadline and without too much cost overruns. Failure to manage any risk category well can introduce uncertainties which can have a knock-on effect on other categories and ultimately the entire project.

The total risk related to the fast track projects are discussed with their level of risks as follows:

The risks can also be regrouped into three main levels:

1. Project level (owner, designer, contractor and sub-contractor),
2. Market level Risks (economic and supplier and government level risks)
3. Other Risks (Risks of any other nature not included in the above two would fall under this category)

## 4.12 Project Level Risks

### 4.12.1 Owner Risks

Owners risks are those risk which are expected to arise because of factors which are internal. Risk of such nature arise because of Risk of non-payment by Owner to contractors, Frequent change of design, Owners intervene improperly, breach of contracts with contractors , Owners' disputes with contractors , bankruptcy of the owner and failure to define the scope of the work clearly by the owner its representatives etc.

Delayed payments on the part of the owner often found to be the sole cause financial hardship for the contractor who would rely on timely payments to carry out the necessary work and to be able to pay the workers, employees and the sub-contractors etc. sometimes it has been expressed by the respondents that the schedule is kept to so tight that a slight departure and slowdown might affect the whole schedule and the schedule is whimsically imposed by the owners. The other major issue which is often encountered at the project site is that the requirement of a several number of design changes which amounts to scope creep and which means the contractor never is able to have a firm grip on the progress of the project is left pondering if the last design change would be enough. This increases the scope of work, needs immediate overhaul of the work and needs skilled manpower to be able to bring about new changes which was not there from the onset. Making too much changes in the scope might make the project finally not being able to achieve the stated original objectives.

In some of the cases the owners of the project did not have sites approval and possession of the site but in order to finish the project in a tight schedule they enter into a contract with the contractor but the project is stalled because the site is not in possession and the same might be the result of inordinate delays and cost creeps as the team is already put in place. In a few cases cited in others research and by responds to the survey it was also found that owners go bankrupt suddenly leading to disputes and

breach of contract leading to long pending court cases and adjudication. The owner risk is ranked as per their significance as shown in the following table:

**Table 5.8:** Owner risk ranking

<b>Risk Definition</b>	<b>Rank</b>	<b>Probability</b>	<b>Impact</b>	<b>Risk Score</b>
Frequent design changes sought by the owner	1	3	7	21
Impractical tight schedule sought to be followed	5	3	6	18
Payment delays by owner	6	3	5	15
Improper and frequent intervention by the owner	7	3	5	15
Bankruptcy of the owner of the project	8	3	3	9
Ill-defined scope of the project	4	3	6	18
Disputes between contractor and the owner	3	3	6	18
Site obstacles such as lack of access and amenities	2	4	5	20

The current study has uncovered the fact that the most pressing concern for the project team and the contractor is that of the frequent design changes being done by the owner and the same is just not the most significant in owner's risk category but also in the entire project environment as well. Bankruptcy and the breach of terms of the contract by the owner has been turned out to be the least pressing risks in the category. However ill-defined scope of most projects and an unnecessary and Impractical tight schedule sought to be followed is quite significant risk for the contractor and making these issues are very difficult. Many other studies including that of have come to the conclusion that delay in payments, ill-defined scope and scope creep along with ill-defined designs and changes in designs of numerous projects in UAE fast track projects have turned out to be significant internal risk factors at the project level (Akintoye, Goulding, & Zawdie, Construction innovation and process improvement. , 2012).

#### 4.12.2 Designer Risks

The designer risks are those risks which involves the risks arising out of ill-defined designs, inappropriate designs not suitable for particular goals, frequent changes being made to the designs and deficient drawings and specifications to activities involved etc.

Designs might be deficient and incomplete, and they include some mistakes and as a result of which it would be difficult to execute. Defective designs are a result of the designer being rushed by the owners and being pushed with a tighter schedule which pushed the designers to think less in order to complete the same within the deadline and not critically analyze the same. poor quality drawings would make sure the contractor is stuck while construction can't be proceeded further because of lack of proper

specification. It has been observed that many Changes by the designer are handled during the construction phase (whether this is to enhance the design or correct a deficiency) also pose a risk if they cause interruptions to the schedule. Delays are also more likely if construction drawings and other documents are issued late. As per the studies undertaken by (Shen ,1997), the deficient designs are one the most significant risks factors causing inordinate delays in construction phase of the project and this is pretty serious when the designers were not focused on the process of construction and their lack of knowledge about the construction mechanisms.

Table 5.9: Designer risk Ranks

<b>Risk Definition</b>	<b>Rank</b>	<b>Probab ility</b>	<b>Impact</b>	<b>Risk Score</b>
Deficient drawing and specification	1	3	6	18
Drawing documents being issued late	2	3	6	18
Frequent design changes	4	3	5	15
Lack of knowledge of construction by Designers	3	3	6	18
Defective Designs leading to frequent revisions	5	3	3	9

As can be seen the deficient drawings made and finalized by the designers are one of the main causes of the project delays and poses considerable amount of risk for both the owner and the contractor. Lack of knowledge of construction by Designers also turned out to be quite significant as the same often needed frequent changes as the design was not found to be suitable for carrying out efficient construction and needed few modifications or procurement of new technology which eventually increased the cost of the project.

#### 4.12.3 Contractor Risks

Contractors often face risk of not having adequate skilled staff and engineers, high labor turnover and low productivity of the existing lab our force. Poor productivity coupled with bad quality of the work done might be a significant source of risk. The various risk that are likely to be faced by the contractors in a fast track project is discussed as follows:

Table 5.10: Ranking of contractor Risks

<b>Risk Definition</b>	<b>Rank</b>	<b>Probab ility</b>	<b>Impact</b>	<b>Risk Score</b>
Shortage of skilled manpower	2	3	6	18
High labor turnover and departure of skilled engineers	3	3	6	18

Lower labor productivity	4	3	5	15
Lower equipment productivity	5	3	4	12
Technical issues	7	3	3	9
Accidents at work site	6	3	4	12
Poor quality of work done	1	3	6	18

The contractor's ability to finish the work in as per the schedule and deliver the project deliverables as scheduled is vital for the safe implementation of a fast track project but shortage of skilled manpower and lower skill level coupled with lower productivity remains major risk concerns for a majority of the UAE fast track projects. Approximately 80% of the respondents to the survey believes that shortage of skilled man power is the most significant risk faced by contractors in UAE fast track projects.

#### 4.12.4 Risks Related to Sub-contractor

The UAE's construction industry in recent times has been increasingly making sue of sub-contractors to make sure projects are completed in time and under tight schedule. While sub-contracting makes sure projects are after, the same also brings its own set of risk including poor quality work, financial hazards and Breach of contract by sub-contractor to the plate. In many cases the respondents to the survey has opined that there are increasing number of instances where the contractor and the sub-contractor went into disputes and long-term delays of the projects. The risk which is generally confronted in relation to sub-contractors are described as follows:

**Table 7.11:** Sub-contractor level of risks

<b>Risk Definition</b>	<b>Rank</b>	<b>Probab ility</b>	<b>Impact</b>	<b>Risk Score</b>
Poor quality work by sub-contractor	2	3	5	15
Disputes between contractor and sub-contractors	1	3	6	18
Breach of contract terms by sub-contractors	3	3	5	15

### 4.13 Market Level Risks

#### Political and government Regulatory risks

Governmental risks include regulatory risks and political instability due to various factors. Regime changes can be catastrophic for sectors of the economy at certain times. Political instability can lead to delays on account of unclear industry norms, lack of clarity in regulatory frameworks and strikes etc. Risks arising out of corruption and bribery is pretty common and it has been found that contractors who were less competent were chosen because their connections while more competent and trustworthy ones were overlooked. The same led to project cost escalations, delays and poor quality of the work and increased maintenance costs for the project's owners. The level of Political and Regulatory risks is defined as shown in the following table:

**Table 7.12:** Level of Political and Regulatory Risks

<b>Risk Definition</b>	<b>Rank</b>	<b>Probability</b>	<b>Impact</b>	<b>Risk Score</b>
Delays in providing regulatory approvals	2	3	5	15
Threat of frequent changes in regulations	1	3	6	18
Frequent Strikes and disputes	3	3	5	15
Changes in working hours	4	4	3	12
Bribery and corruptions in administrative depts	5	4	2	8

As can be seen from the above table the most significant threat here is that of Threat of frequent changes in regulations and Delays in providing regulatory approvals to the project teams. these can be significant risks for the entire project as work could not be started even everything else is ready and the same leads to cost overruns.

### 4.14 Other Risks

#### Social and Cultural Risks

Social and cultural risks are those risk which arise of contradicting ways of dealing with local customs and often includes violent behavior at workplace and cases of increasing substance abuse by workers and managers.

**Table 7.13:** level of Social and cultural risk

<b>Risk Definition</b>	<b>R an k</b>	<b>Probab ility</b>	<b>Impact</b>	<b>Risk Score</b>
Cultural conflicts (tradition etc.)	2	3	4	12
Criminal activities committed by workers and managers etc.	1	3	6	18
Substance abuse by workers	3	3	5	15

Social and cultural risks cited above have the lowest level of risks identified but the same nevertheless needs to be taken care of. Criminal activities on the part of the workers and groups within the workers is one of the major concerns for a fast track project management team. UAE is a highly diversified economy with a large no of expatriates forming backbone of the labor class and professionals and hence a clash of culture is a more likely event as the workers includes several group of nationalities is leading to a range of faith and belief and hence a middle path is required to keep the flock together (Jeljeli, 2005).

#### 4.15 Economic Risks

Economic risk often arises because of market events like increase in inflation and shortage of supplies leading to high prices which can easily be the sole cause of cost overruns. Materials shortage in the economy and experts would be one of the most significant causes f delays and financial risks. Foreign exchange fluctuation can also mean losses for the owner if they have to pay the contractors in USD or other major world currencies and hence adequate risk mitigation measure must be put in place to get of these economic risks (Zaneldin, 2006).

Table 7.14: Level of Economic risks

<b>Risk Definition</b>	<b>Rank</b>	<b>Probability</b>	<b>Impact</b>	<b>Risk Score</b>
Inflation and price change risks	3	3	4	12
Materials shortage	1	3	6	18
Manpower shortage	2	3	5	15
Foreign Exchange fluctuation Risk	4	3	4	12
Technology and Equipment Shortage (unavailability)	5	3	4	12

#### 4.15.1 Other Risks

The other risks include those risks which are not categorized in the above categories and includes a broad range of activities related to fast tracked projects. One of the issues that needs special attention is that of dealing with delayed resolution of various disputes between parties involved. A majority of the respondents also believed that an unfair tendering practice is also a leading cause of delays and prior work quality. Protections given to non-skilled and inexperienced suppliers and contractors is a major concern for delays and cost escalations (Jaafari, 2010).

Table 7.15 Level of Other risks and their significance

<b>Risk Definition</b>	<b>Rank</b>	<b>Probability</b>	<b>Impact</b>	<b>Risk Score</b>
Long delay in resolving disputes	2	3	4	12
Absence of a suitable dispute redressal mechanism	1	3	6	18
Insurance claim settlement delays	4	3	3	9
Lack of regulations in tendering process	5	3	3	9
Protectionism to local contractors and suppliers	3	3	4	12

## Chapter – 5 conclusion and Recommendation

### 5.1 Introduction

The conclusion and recommendations chapter is used to summarize the findings of the project research done as per the principal objectives of the study. After the summarization, the primary emphasis would be to reach necessary conclusions and analyze the present scenarios in the UAE fast track project environment to provide recommendations to deal with the risk arising from the same (Barkley, 2004)..

### 5.2 Summary of Findings

The primary purpose of the research was to delve deeply into the fast track project environments in UAE and Dubai where a large no of projects is put into fast track area to complete the same projects in a very timely basis and to make sure the projects are integrated into the economy as quickly as possible. It would be one of the endeavors to know how the project environment changes if a project is fast tracked and how the same bring new risks into the project space and what the project teams do to tackle such risks to be able to complete the projects in time and save costs (Creswell J. , 2009).

The motive behind undertaking the current research was to investigate the use of risk management into the planning process of projects being implemented on a fast track basis. This project is further sought to identify techniques and methods that are specifically suitable for the identification and control of risks in planning process of fast-track projects in the UAE's construction industry. This research project would look into how the project managers integrate risk management into the planning process of projects being implemented and if Risk management practices undertaken by the Project teas in projects like Dubai Expo etc. are sufficient to manage and eliminate the negative effects of Risk arising in the implementation and after life of the projects (Allen, 2017).

Project risk management involves the identification, analysis and responding to any risk that arises over the life cycle of a project for making sure the project remains on track and is able to meet the

goals. Risk management isn't reactive only and it shall be designed to be part of the planning process to figure out risk that might happen in the project and how to control that risk if it in fact occurs. It can be noted that risk can arise in any step of the project processes and thus it is a necessity to be ready to deal with risks of any kind from the very beginning. Because risk can be greatly affecting the goals of the projects risk management is necessary for identifying, categorizing, prioritizing and planning for risks before they become issues. For this purpose, the current research dissertation looked into the aspects of risk management practices undertaken by fast tracked Mega projects teams and specifically the followings were implored:

- e) Previous researches done by earlier scholars were reviewed to get an understanding of the hazards involved and the methodology behind the fast track environment.
- f) The fast track specific risks were identified and analyzed in detail after taking into consideration the detailed planning process of fast-track projects in the UAE's construction industry and classified them.

In the current research, it was decided to employ questionnaires to explore the phenomenon of fast-track projects in the UAE. Since the aim was to compile an accurate profile of developments in this emerging area, a descriptive design was chosen as the most suitable. The descriptive research design is distinctive in the quantity of variables used; it can accommodate several variables but only needs one to answer the research question (Zikmund, 2009).

As the research was found to have unearthed a great deal of both numerical data and non-numerical data for their analysis, it was decided to make use of a mixed research approach. If the variables and the data is both types and one can't be totally omitted then it is paramount to have mixed research paradigm to include both qualitative and quantitative methods and the current research made an attempt to have both methods included for data collection and data analysis (Bryman, 2012). The survey was conducted after the secondary research such as the review of the literature was done, and concepts and frameworks and parameters were duly identified and noted. Therefore, the study used an embedded mixed-method design, where the quantitative pre-test data and results are performed before the qualitative process and interpretation of post data and results (Creswell J. , 2009). The questionnaire was designed as a power tool for collecting the relevant data and including adequate number of respondents to be part of the data collection exercise. Since the aim

was to compile an accurate profile of developments in this emerging area, a descriptive design was chosen as the most suitable (Zikmud, 2009).

### 5.3 First and Foremost, Achievement of the Objectives

The primary objective of the study was to assess the risks, identify them, categorize them and analyze their impact and group the risk together to have a better understanding of the risks. A breakdown of the risks allowed the risk to be identified as either internal or external. Internal risks were those risks which were generated from within the working of the project organization and external risk were those which were generated through external factors out of the purview of the project organization. Both of these risk categories were found to be capable of affecting the success of the project which is being implemented.

Internal risks identified to have five different categories of risks including those of owner related risk, contractor related risks, sub-contractor related risks, risk of suppliers and designer risks. On the other hand, the external risks were more varied including those of social and cultural risk, macroeconomic risk, other risks and political risks.

Approximately 41 different risks were identified in the process of risk identification and risk scores and their impact were allocated on the basis of assertions of risk and respondent answers. Most of the risks were project related which included the risk of owner related risk, contractor related risks, sub-contractor related risks, risk of suppliers and designer risks. Market related risks were of political and macroeconomic risks. Other risks included risks emanating from social and cultural back ground and they can also arise from either project or market related conditions. From the analysis of these risks it was uncovered the fact that the most pressing concern for the project team and the contractor is that of the frequent design changes being done by the owner and the same is just not the most significant in owner's risk category but also in the entire project environment as well. Bankruptcy and the breach of terms of the contract by the owner has been turned out to be the least pressing risks in the category. However ill-defined scope of most projects and an unnecessary and Impractical tight schedule sought to be followed was quite significant risk for the contractor and making these issues are very difficult. Many other studies including that of have come to the conclusion that delay in payments, ill-defined scope and scope creep along with ill-

defined designs and changes in designs of numerous projects in UAE fast track projects have turned out to be significant internal risk factors at the project level (Akintoye, Goulding, & Zawdie, Construction innovation and process improvement. , 2012).

While the Contractor and sub-contractor risk were found to have the highest overall impact and risk score the same for the social and cultural risks were found to be the lowest. At the same time the suppliers, owners' risk and designer risk were estimated to have critical level of impact among risk identified. As a result of which it was found that the designer risk, contractor and sub-contractor and owner risk were central to managing risks well in fast track projects in UAE.

The risk score indicated the criticality of the risk identified in the study. If a risk has a lower probability of occurring and lower impact, then the risk mitigation measures even if failed or partially successful then the same would matter less for the project team management. However moderate risk like the natural causes affecting projects, other risks and internal risk with high risk scores need effective and long-term risk management plans and if the measures fail, they would definitely have an adverse impact on the project's outcome.

The findings of the survey were further validated by a hypothesis testing in which the hypothesis assumed that there is the presence of a statistically significant relationship between the perceived necessity of risk management and its general implementation of the risk management process and framework in the in fast track construction projects in UAE. The hypothesis was accepted by the application of a chi-square test and the initial assumptions was a validated and it was accepted that the respondents of the survey were right when they expressed their opinion in favor of the need of a proper risk management plan for the effective mitigation of the risks related to a fast track project.

#### 5.4 Achievement of Secondary objectives

The 2<sup>nd</sup> most important objective of this research was to make sure there was an in-depth qualitative study of the literature associated with fast track project risk management and how the same is applied in UAE construction industry. The research found that most companies in the construction sector were either private entities or government owned and a very low no of foreign layers as well. These companies in general undertook construction of large infrastructure projects, buildings and shopping complexes etc. the average budget of the projects was also found to be in

the vicinity of USD 1 bn approx. Most of the projects undertaken in the last 10-15 years were fast tracked as the owners of the projects wanted them to be completed as soon as possible and integrate them with the economy's emerging sectors. As the UAE economy was being constructed from a hydrocarbon-based economy into a more open-ended non-hydrocarbon economy with most emphasis being put on creating new infrastructure in the leisure and travel sectors and hospitality sectors, there was a need for speedier implementation of these projects and fast tracking was the most preferred method. A thorough examination of the available literature and from the survey undertaken it was found that there was a greater degree of awareness of high-level management familiarity with risk management processes and the same was integrated with project plans to deal with them diligently and efficiently.

From the literature review and also from the survey of the respondents selected it was revealed that a wide variety of methods such as Delphi technique, brainstorming and interviews and group discussions took place for identification and analysis of the risk involved and to reach a necessary and justified conclusion as to how these risks would be mitigated. The general responsibility of the risk management often found to have lied with the project's contractor or the project manager and the necessary responsibility was often fixed with fixing of risk ownership and fixing of the action plan. It was found that under the traditional method the risks might be allocated entirely to the contractor and the same allowed them to increase the projects overall budget to keep a buffer against potential issues which were expected to arise in due course, the current allocation of the project often allow the risks to be shared between the contractor(project manager) and the owner. However, the risk management process also expanded in recent times to include a more acceptable method of responding to risk in the fast track construction projects including the methods like acceptance of risks, avoidance of risks, transfer of risks and reduction or mitigation of risks. Managers choose the method most likely to reduce cost of the projects and which are likely to avoid cost escalations and overruns and are more likely to avoid project related losses. The UAE's construction industry is also found to have expanded pretty quickly and as a result of the same larger and riskier projects are now being implemented on a tighter schedule which calls for fast tracking and which in turn gives rise to new forms of risks. As a result of increased probabilities of risks and their risk levels, there is a consensus among respondents that a proper risk management framework needed to be put in place.

Another finding of the study was the fact that both the combination of the literature review and the view expressed by the respondents claimed that the fast track method of projects being undertaken in UAE has increased in recent years. It can be seen that most organizations have undertaken to implement fast track projects in the last 5-10 years. While 5 companies were seen to have undertaken 1-5 projects, 12 companies undertook 5-10 such projects. 30 small scale fast track projects were undertaken by 1 company only. This shows that a number of projects were fast tracked in UAE as the same were done to integrate the finished project with the economy sooner and clients were eager to get the projects completed in record time frame. At the same time, it was also asked to the same set of respondents to tell if their entities are planning to undertake new fast track projects in the coming few years and the following figures were revealed through the same (Peck, Olsen, & Devore, 2016). There was a general consensus among the survey respondents that a large no of projects is likely to be undertaken or taken up by the entities of the respondents in the coming few years. 7 organizations were having 5-10 fast tracking projects in the pipeline and another 7 have 10-20 projects in the pipeline. However only 1 entity is known to have 30 different projects pipelined to be implemented in the next few years. This shows that the fast track method of the project implementation is gathering steam and is quite popular mode of project management in UAE. More and more UAE projects are being put under the fast track method to make sure the projects are finished in a tight schedule and that to without adversely affecting the budget of the project. For example, major government projects such as the Abu Dhabi International Airport and the Dubai international (Al Maktoum) Airport and the Dubai Metro project was built and expanded under the fast-track methods.

In general, the overall success or the failure of large construction projects is judged by the projects quality of construction and the cost of the project adhered by the budgets. However, in some cases the fast Track projects can fail as well. Firstly, the project would go out of control when the people involved to the tools being used and the work is not capable of being measured reasonably in a short period of time. As a result of the same the managers in charge would not be able to estimate the exact work output and report about the work whether the work progress is as per schedule or behind the schedule. Larger construction projects are known to generally face such issues since they can't be divided into individually measurable units all the time. These findings pointed to

wars the face that fast track projects needed a project management structure which is matrix in nature, and which is capable of being more communicable in nature. Traditional project management organizations are generally late in reacting to issues and problems and this is where matrix project organizations can be more flexible and reactive. Matrix project organizations would be able to react and adapt well and the same would allow for taking quicker decisions to manage the necessary risks arising out of delays and the same was found to be reasonable through various literature that exist in project management studies.

One of the major objectives of the current research study was to be able to propose a risk management or mitigation framework for the fast-tracking projects. The risk mitigation framework used in this study called for identifying the risks as interrelated and the model has been used to identify and categorize the risks related to fast track projects and interlink them as to how one can affect the project and also affect other types of risks as well. For example, a market level risk can have a profound impact on the market level risk.

The current research study has set out a framework for process-driven risk management with relation to the UAE based fast track projects. First the risks were identified as per their category and then the risks were identified for the risk probability, the likely impact of these risks on the project output and the overall risk score. A higher score indicated a severity of risk. Among all the risk identified the owner risks or project level risk and contractor risks were found to be more severe as they can affect the project outcomes severely. However, one of the aspects which need some attention from planners is the fact that new project management teams put by the contractors did not have access to reports and documents of the risks faced by the earlier project teams. Hence the framework calls for preparing a digital database of risk management and mitigation documents be prepared by big construction teams and contractors so that future teams can find it easier to deal with similar risks. The findings also pointed towards the planning of a continuous risk management process in large projects to make sure the risk is managed in time and without too much affecting the project outputs.

## 5.5 Recommendations for Risk Management in Fast-Track Projects in UAE

The recommendation section of the research study is trying about reflecting about the findings and make some suggestions which might prove to be useful for the contractors and project team managers to deal with risk arising in fast track projects.

### 5.5.1 Risk management Recommendations

- a) Risks which were identified to be arising in fast track projects are found to be manageable by project teams and the analysis could be helpful for contractors who can make an elaborate plan to counter the risks and its negative effects and save some time and cost from being incurred. It is clearly evidenced that the quality of a fast track project outcome is directly related to how meticulously the management plans risk mitigation. It also found that cost can be reduced significantly if the risk amazement plans are planned and approved an duly in place from an advanced stage. there was a general consensus among the experts whose literature was analyzed and respondents that risk management is more successful and effective specifically when the project team and the contractor is more aware fo what to expect in the execution of the fast track projects. Contractors should implement the recommended risk management strategies as they are applicable in real life project situations.
- b) In the overall scheme of things, the roles played by the planners are becoming more important. The contractors and the project managers role in the identification of the risks and anticipation of the risk that can arise in the execution stage. Risk can arise for a source and can impact a project in a particular way and hence it is paramount for the contractor or project manager to do identify the source and take steps to plug the same. Particularly the sub-contractor risk can be given more attention and contract terms be inserted in a manner so that tasks are minimized, and disruptions are avoided. Risk must be categorized, and their overall impact must be assessed (risk score) so that they are dealt with efficiently to deliver the project as per the schedule and as per the budget.

### 5.5.2 Recommendations related fast tracking of Projects

- a) It was found that UAE construction industry is quite positive about the fast tracking of larger projects and more and more companies are making use of the method to finish projects in a short time frame and without incurring more for the project. This is having a positive impact on the industry but still the contractors have not been able to develop a structure which can be ideal for such projects. A balanced and matrix structure can be flexible and useful. A matrix organization is thought to be more useful and more communicable to iron out the risks arising out of rigid form of communication. Fast tracking can be more effective only if the risk is identified and monitored and then effective controlling measures are put in place at the right time. Risk managers must oversee the control over the risks and feedbacks are communicated sooner to make sure changes are initiated quickly.
- b) Construction companies and specifically the contractors must undertake campaigns to familiarize the concepts of fast tracking and its benefits. However, it must be considered that fast tracking as a concept is only in its emergence stage and hence contractors, sub-contractors and project managers be given a learning opportunity to get used to and work upon the same.
- c) Right now, there is not standard measure of a fast-tracking project contract and hence different templates are used. If a standard can be developed for use the same can be very useful in making sure the disputes and difference of opinions which arise from random issues can be managed well. However, the same needs industrywide consultation and acceptance for being useful.

### 5.5.3 Recommendation for Risk Mitigation

The research project has made sure the source of the risks (41 in all) were identified covering a large area. The owners of fast track projects along with contractors of such projects can make use of such ideas to identify the risk which are critical for their projects and understand its impact and pinpoint measures to nullify its effects. Some of the risk can be accepted as they can't be done away with. However, some of the risks need treatment and some of them can be transferred to third

parties. So, the identification and analysis of the risks and their impact would lead to a better risk mitigation framework for individual projects.

Industry best practices with respect to particular risk must be adopted for effective neutralizing the negative impact of particular risk. For example, supplier risk can be nullified through the selection of the best possible supplier available to the project owner and the contractor. Suppliers background and experience must be checked to make sure the suppliers have the necessary financial strength to undertake uninterrupted supplies. Also, the Project team must keep a risk register for entering suspected risks and the same has to be discussed and analyzed in order to mitigate the effects.

Managers who has never worked in fast track projects must be selected with care. The inexperienced managers be trained how to deal with such projects and more awareness be created. The managers who are selected to work in fast track projects must also be given special training to be able to work upon the risk management aspect of the project. They shall have the skillset which is required to identify the sources of risk and take measures for their containment.

## 5.6 Challenges Faced during the Project Execution

A project of any size needs proper understanding of the reported variables and hence can't be expected to be completed without any difficulties. In this research, the primary difficulty was faced in the time of selecting the right candidates to take part in the study survey. A fair bit of time was spent in making sure the information collected would remain secret and far from public domain. Also agreeing to match the variables of the study to the literature was time consuming.

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## Appendix

### SURVEY QUESTIONNAIRE

No 1: You are presently working with or worked with a company which is?

Local (UAE based)

International

Government Company in UAE

A private company in the UAE

No 2: What is the name of your company:

.....

No 3: What is/was your role in the company's fast track Projects?

Designer

Contractor

Construction Manager

Others.....(specify)

No 4: How many years of Experience you have /had in the Construction Industry?

0-3 years

3-5 years

5-10 years

More than 10 years

No 5: How many years of experience you have/had in the UAE construction Industry?

0-3 years

3-5 years

5-10 years

More than 10 years

No 6: Have you ever worked as an independent decision maker in relation to a fast track construction project?

Yes

No

No 7: which kind of construction sector you have worked with :

Housing sector

Building

Industrial construction

Heavy engineering and infra projects

No 8 : the average budget of the construction projects you have worked with :

AED 100 million or lower

AED 100-300 million

AED 300-500 million

AED 500 – 2 billion

AED 2 bn and higher

No 9: In your work tenure how many fast track projects were known to have been undertaken by your organization in the last decade?

0-10

10-20

20-30

30-50

No 10: Do you think the fast-tracking projects are very common in UAE?

Rare

Very few

Many

Frequency is too high

No 11: Do you think fast tracking of project would come to stay in UAE in the next decade or so?

Yes

No

Not sure

No 12: Were you responsible for managing risk in your organization related to fast track projects in the recent years?

Yes

No

No 13: Do you think the risk related to projects are appropriately allocated in construction projects in UAE?

Yes

No

No 14: Do you think Owners and clients deliberately make delayed payment to contractors in UAE?

Yes

No

No 15: Do you think owners of projects try to set deadlines which are too stiff and unreasonable in the first place?

Yes

No

No 16: How frequently the owners in UAE have been pressing for changes in design in advanced stages of projects?

Not at all

Sometimes

Frequently

Very frequently

No 17: How often you find the clients or owners breach contracts with contractors?

Not at all

Sometimes

Frequently

Very frequently

No 18: How many times owners' suddenly go bankrupt?

Not at all

Sometimes

Frequently

Very frequently

No 19: How frequently design defects have led to risk arising in projects?

Not at all

Sometimes

Frequently

Very frequently

No 20: Do you think Accidents occurring during construction has been a major cause of risk in a fast track project?

Not at all

Sometimes

Frequently

Very frequently

No 21: How often labor and manpower shortage has led to delays and cost escalations etc. leading to fast-tracking of the project?

Not at all

Sometimes

Frequently

Very frequently

No 22: How often the fast projects have encountered risk arising out of low productivity of labor?

Not at all

Sometimes

Frequently

Very frequently

No 23: How often the fast projects have encountered risk arising out of low productivity construction equipment and lack of advanced technology?

Not at all

Sometimes

Frequently

Very frequently

No 24: How often you have encountered new risks arising out of Lack of qualified staff in the contractor's organization?

Not at all

Sometimes

Frequently

Very frequently

No 25: How often you have encountered new risks arising out of Sub-contractor organization's poor performance and poor man-management etc?

Not at all

Sometimes

Frequently

Very frequently

No 26: Is the Breach of contract by sub-contractors often posed risk to deadlines fast track projects?

Yes

No

No 27: Has the financial standing or lack of financial strength of contractors, suppliers and sub-contractors posed serious risk to the completion of the project?

Not at all

Sometimes

Frequently

Very frequently

No 28: How often disputes between main contractor and sub-contractors led to days and renegotiation on contract terms?

Not at all

Sometimes

Frequently

Very frequently

No 29: How often disputes between the clients and the contractor/ sub-contractors led to delays and renegotiation on contract terms?

Not at all

Sometimes

Frequently

Very frequently

No 30: How often Delays in granting approvals by the clients or owners representative led to redesign and delays in the execution of the fast track projects?

Not at all

Sometimes

Frequently

Very frequently.