

Risk Factor in Construction Industry

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Abstract: The aim of the study is to identify the risks in construction industry, understand how they are dealt with, and propose more effective frameworks for risk management in fast-track construction. A mixed method approach was used to fulfill the objectives of the study. Data was collected via literature reviews of print and website articles, and of books and documents from company, government and industry-specific databases. The findings show that risks in construction projects can be internal or external, and that in the owner- and design-related risks are seen as the most significant. Knowledge about risk management is present, but more needs to be done to eradicate the problems associated with poorly managed fast-track construction projects. The study discusses the implications of risk management for practitioners and academicians in the construction industry. Poor risk management, which is usually the consequence of inadequate recognition of and/or responsiveness to risks and uncertainties, can have a devastating impact upon projects. It is hoped that practitioners applying the findings and suggestions in this study will see positive change, improved profitability and greater competitive advantage as a result.

Keywords: Construction industry, Risk Management, Risk Analysis

1. Introduction:

Risk management involves estimating and analyzing project costs, and then developing and implementing measures to correct risk problems. Present risk management techniques often tend to concentrate on variances that are in linked items the moment the risk overrun is revealed, but what is needed is a risk management methodology that looks for potential risk issues and warns project managers as early as possible before the risk occurs. Risk analysis is recognized as a main subset of project management, but its application is limited in the construction sector, it tends to be used only for the development of schedules or risk estimates.

A better risk management technique would foresee potential risk issues by applying risk simulation and analysis techniques to target areas where risk escalations are most expected. Risk analysis should also be used to reveal those areas where a competitive advantage may be achieved.

2. Research Problem:

The construction industry is complex and subject to a higher level of risk than other industries, making effective risk management vital. Project completion within the expected time span has always been the most challenging task for construction companies, with many failing to deliver on the agreed schedule, cost and quality. The challenge is even greater with fast-tracked projects, where the schedule must be accelerated in order to cut costs, but there must be no compromise on quality. It needs a valid risk mitigation framework that is appropriate for mitigating the levels and categories of risks unique to the country's construction industry and especially its fast track schemes.

3. Research Aim:

Combining these two considerations – the growing trend towards fast-tracking and the need for more effective risk management – this project seeks to identify techniques and methods that are specifically suited for the identification and control of risks in fast-track projects in the UAE's construction industry. Fast-tracked projects should be less costly than conventional projects because they are completed more quickly; even so, they should be of comparable or better quality.

4. Risk Management:

Risk management entails a process in which the risks of a specified operation/project are measured and modeled. Risk management involves the systematic study of a range of relevant factors, so that the probability

of problems arising can be estimated, the nature and likely consequences of these problems can be identified, and thought can be given to how these consequences can be avoided or at least mitigated. Risk management for construction projects can be conducted by matching the project's capital needs to the industrial context and running construction system simulations. Simulations highlight potentially precarious situations and limitations in the construction environment.

5. Risk Identification:

It is important to realize that construction risks are not the same in all countries but vary depending on the local political, cultural, economic and social conditions. It is important to realize that construction risks are not the same in all countries but vary depending on the local political, cultural, economic and social conditions. Risk sources can be financial, strategic or operational and can lead to higher than predicted expenses in procuring materials, or lower than expected sales after the project completion, or poor accounting during the project management phases. Examples of financial risk sources include government and commercial factors, while strategic risks can arise as a result of inadequate staff training or poor marketing; and problems with production, security and maintenance are all sources of operational risk. Health and safety regulations and environmental concerns can pose an additional compliance risk. Risks are mainly be identified as internal risks and external risks. These categories may be sub-divided into contractor, political and economic risks, among others.

5.1 Internal risks

Those risks that directly relate to the project and fall under the project management team's control are termed internal. These risks are again divided according to the specific originator such as the designer, contractor, owner, suppliers and sub-contractors.

5.1.1 Owner risks

Studies have identified various ways in which the project owner can become another source of risk, for example, by delaying payments to contractors, imposing an unreasonably tight schedule, making design changes, intervening in the project, delaying contractors' access to the site, not defining the scope of the project, suddenly going bankrupt or breaching the terms of the contract. Financial hardships for contractors since these payments are the source of income for the project, while rigid schedules may be impractical or difficult to achieve. Owners may also demand design modifications which may turn out to be dangerous or jeopardize the contractor's chances of achieving the project's schedule.

5.1.2 Designer risks

The main problem here is usually impractical designs that are difficult to implement, but risks can also arise if the drawings are poorly executed or the specifications are incomplete or inaccurate. Documents may not be issued in time. Changes made during the construction phase by the design professional, whether to improve a design or correct deficiencies, can also pose a risk for the contractor

5.1.3 Contractor risks

Contractors become risk sources by producing poor quality work or low productivity, by demonstrating incompetence, by being involved in accidents at the construction site or by being unable to deal with unexpected technical challenges. They can also pose a risk if they have too few staff, if key staff leaves in the course of a project, or if they become engaged in disputes with sub-contractors. Accidents caused (or suffered) by contractors during the construction phase can lead to cost overruns, loss of morale, delays and loss of productivity.

5.1.4 Sub-contractor risks

As indicated above, sub-contractors are an additional source of risk. If they fail to deliver the work as agreed with the contractor, this can result in breach of contract. Where sub-contractors are not qualified for the job, this can lead to poor performance.

5.1.5 Supplier risks

Suppliers can cause risks in construction projects by failing to deliver materials on time or by delivering poor quality materials.

5.2 External risks

Internal control systems have no influence on external risks, which may be caused by social, natural, economic, political and cultural factors. Research has associated each of these categories with various risk events.

5.2.1 Political and government risks

Political risks include war threats and political instability. Changes in regulatory guidelines and rules may also affect the project. Other risks are posed by workers' dissatisfaction or even industrial action, which can interrupt project activities and negatively impact the project's objectives. Studies have also identified delays in permit approvals and corruption among officials as possible sources of risk affecting construction projects.

5.2.2 Social and cultural risks

Social and cultural factors which have their origins in the external environment may nevertheless create conflict within the project; for example, cross-cultural differences, substance abuse and criminal acts.

5.2.3 Economic factors

Sudden changes in prices and inflation were the most significant economic risk factors for local and international companies in his study. Other economic factors which can pose risks to construction projects are shortages, whether of equipment, manpower or materials, and currency fluctuations.

5.2.4 Natural factors

Natural risks may include unpredicted inclement weather and unforeseen site conditions.

5.2.4 Other factors

Identifies another category of external risks that he refers to as "others". Into this miscellaneous category he places events such as difficulty in claiming insurance, local protectionism, unfair tendering practices and delays in resolving litigation and contractual issues.

6. Risk Management Plan

Comprehensive risk management plan incorporates seven stages:

Stage one: Defining objectives. It is important to record the project goals and objectives in a way that can be comprehended by all team members. At this stage, the stakeholders should be identified and the project requirements assessed to ensure that they are realistic. Any assumptions and challenges relating to achieving the project's outcomes must also be reviewed. The expected benefits should also be noted.

Stage two: Production of the risk management document. This should set out the objectives and scale of the risk management process, the roles and responsibilities of the project team, the contracting organization, the devices and techniques to be implemented, details of the reporting cycle, review arrangements and deliverables. All project management team members should work to this document.

Stage three: Identification. Risk identification techniques include interviews, mind mapping, brain storming and fish bone diagrams. Identification should be consistent, comprehensive and meaningful even to those with little knowledge about the subject. Risk is unavoidable in construction projects, so this step is crucial. The main objective of risk identification is to enable project managers to deal with risks proactively rather than reactively.

Stage four: Assessment. Risk assessment, which should be strategic and objective, may be conducted using qualitative or quantitative methods. Quantitative methods describe risk in mathematical or statistical terms and are used to identify the main issues in a fast-track project and to justify a comprehensive risk analysis. Qualitative methods, on the other hand, provide explanation and allow prioritization of the risk issues. This is especially important in large projects, where it should always be given top priority.

Stage five: Planning. When the risk has been identified, the risk management team must develop a response plan that is achievable, appropriate and affordable. Teams are assigned to handle specific activities and a timetable is set.

Stage six: Management. The effectiveness of the chosen response strategy should be monitored as the project progresses. If necessary, better alternatives should be identified in order to sustain the risk management process.

Stage seven: Feedback. Effective feedback is key to helping managers learn from mistakes and successes throughout the lifecycle of the project. It allows for continuous revision and amendment of risk responses to ensure a positive outcome. Many projects allow the project management team to revise their initial risk estimates.

At all stages, communication between team members and the public or other stakeholders is essential to control and reduce risk. The development of a plan containing an estimated schedule and initial cost planning is part of risk analysis. A comprehensive risk management process can be performed using modeling techniques to simulate situations and gain insight into how risk may be minimized.

6.1 Project risk management features

Risk management should promote authentic reasoning and ensure that events and risks are evaluated objectively. It should foster innovative thinking and project team engagement; consider the threats and opportunities presented by the risk; and take into account operations within the facility, ongoing risk management processes and managers' experience at handling risk in fast-track projects. A standard risk management framework may be applied to help decision makers and to focus management attention on key areas of risk, but the process should still have sufficient flexibility to adapt to project-specific issues.

The total risk management (TRM) approach identifies risks as uncertain events which, when they occur, have an effect on the objectives of the project or organization. TRM acknowledges that risk has downward or upward potential and that it can have both negative and positive impacts on a project. TRM focuses specifically on the people involved in the risk event – their culture and behavior during change, and how they manage all aspects of the occurrence. It is not based on a particular tool, but involves the application of common sense, and practical and hands-on processes are used in all phases of the project. TRM gives ownership of risk management to a person or party that is most familiar with the process.

6.2 Risk reporting structure and process

The risk reporting process entails the identification, control and containing of risk. The structure should be made up of a hierarchy of people who have the knowledge, skills and tools to support attainment of the project's objectives and effectively manage the risks to the advantage of the company. The risk reporting structure ensures that project members embrace policies, follow processes, and adopt suitable approaches and issue reports in order to fulfill the requirements of both the contractor and the client.

Managers should provide owners with a fair review of the most notable risks and how efficient the internal control systems are in handling these risks. The process involves identification of weaknesses or faults, and the impact they have had, have, or may have on the project. This should be followed by an outline of the actions needed to rectify them. Risk information should be communicated regularly and in a timely manner to enable the management team to make informed decisions. A significant role of risk managers' practice is to receive, review and act on the risk management report.

6.3 Value of risks

Real business opportunities cannot exist without risk. The larger the opportunities, the higher the risks, but with proper risk management, the risks can be turned into ventures for realizing opportunities. The management of risk and the search for the best value for money have been the subjects of much debate as clients and the industry as a whole look for opportunities; many project management advisers now provide value and risk management services alongside or as part of the project management framework.

This is a framework comprising cost competitiveness (financial risks/opportunities), stakeholder confidence (compliance risks/opportunities), customer reach (strategic risks/opportunities) and operational agility (operations risks/opportunities).

Risks associated with price competitiveness include political impositions, national debt, market risks, macroeconomic risks, pricing and profit pressure and cost reduction. For example, if pricing pressure forces public construction companies to cut costs and lower their prices, this may give them a competitive advantage over private companies whose prices are higher. On the other hand, it may risk the quality of the project deliverables; this represents an opportunity for private companies, whose products will be more popular because of their superior quality.

Risk sources that impact stakeholder confidence include government involvement through regulations and laws of compliant that can be easy or hard for the investors. The decision of stakeholders to invest in projects is largely determined by whether the regulatory framework is welcoming or discouraging. Opportunities can be uncovered when investor relations are good, promoted through public appeal matters such as green procurement, corporate social responsibility and public relations to build image and public confidence. The customer reach dimension is critical for the sustainable growth of a company. Risk sources here include emerging technologies, whose availability and usability will influence what the customer wants to buy or invest in. On the other hand, opportunities may be offered by new marketing channels, such as websites, which allow project consultants and construction firms to advertise their services. Other opportunities include the emergence of new markets and the growing demand for newer, improved products, services and operations.

The major risks associated with the operational agility dimension are talent management and skill shortages. Construction companies are defined by their technical skills; lack of the required skills and knowledge can negatively affect production and achievement of the project deliverables. However, this risk can

be turned into an opportunity by using underwriting tools, procedures and training to obtain credibility for funding, and technology support. Although risks are inevitable when pursuing business opportunities, their value can be determined in the financial, compliance, strategic and operational dimensions which help to preserve the economic/financial vitality of the organization, enabling firms to establish stronger relationships with their partners, maximize the future market chance for products and services and react to a shifting market.

6.4 Opportunities of risk

The way to balance risk and opportunity is to look at them as two faces of one coin. Usually, people look for opportunity to be larger than risk, but it is important to assess both realistically and to manage their strategic, financial, operational and growth impacts. Visionary investors/managers tend to identify and map new strategic opportunities rather than grow existing ones, basing their strategy on market insights and emerging technologies. Initially, the risks in new opportunities may not be evident. The challenge is to minimize the chance of these risks becoming real events. Financial risks and opportunities can arise at any point from the start-up phase of the project to the development phase. The first thing to be done by the project manager or client is to assess the risks associated with and the value of the investor funding and how to carry the debt. They must then maintain a balance between revenue flows on the one hand and expenses, burn rates and investment in marketing and employees on the other. Once the project is operational, the opportunity can be maximized and the risk managed by implementing integrated processes and a rules-based control model to deal with unauthorized, unethical, inappropriate or illegal action by staff and any deviations from the routine process. As far as growth is concerned, the scale of the project is a balancing act between risk and opportunity. Growing too fast may risk quality and the ability to deliver, while growing too slowly leaves the project open to the risk of being overtaken by a new technology or competitors. It is always important to find a balance, such that the growth phase of the project should be neither too fast nor too slow.

Risk may affect the project's ability to meet its operational performance, capabilities, cost and other objectives and reduces the opportunity for growth. With a clear understanding of all possible risks, the project manager is able to quantify and prioritize them and take action to minimize the chances of failure. Whereas risk management concerns itself with possible failures in the project, opportunity management focuses on the likelihood of better things happening. As opportunity management leads to decisions regarding establishing and sustaining worth for the project, it should be part of the project management process and integral to the organizational culture.

The process of opportunity management involves generating ideas and then recognizing and driving opportunities. The first step is for the project management team to identify potential opportunities that could arise as a result of the project. Brainstorming, stakeholder meetings, jurisdictional reviews and focus group interviews can all be used to identify project opportunities. Next, the team should evaluate and prioritize measures to enable adoption of more effective courses of action in the future. It is critical that the members brainstorm for opportunities during decision-making in order to allow a more comprehensive scope of ideas on opportunities.

Opportunity management and project risk management requires a lot of commitment in order to transform organizational culture and enable tools, and processes that would be applied consistently in the management process. The applications can be explained as follows: Managers to use appropriate means to ensure the culture of risk and opportunity management is positively accepted. Next, the risk management process should not be unnecessarily complex but a simple and effective process that involves simple access, identity, plan and control and probability measurement to help build a risk management profile that can be referred to the identification of opportunities and reduction of costs. The integration of both simple and complex risk management tools across the project activities is extremely beneficial in improving the qualities of project designs. Consistent risk management in the project environment should be a routine process. It must consider the culture of the project organization otherwise there would be low employee performance which will translate to increased costs and reduced opportunities).

When opportunities are identified during project risk management, the likelihood meeting customer demands is high and this will place a company at a better competitive advantage in the industry.

7. Summary and Conclusions

Various key points essential to this study emerge from the review of literatures on risk management in construction projects. The risk management process which comprises of steps such as risk identification, risk assessment/analysis and risk response are important for the objectives of this study. Majority of the studies have

agreed on identification of risk categories as internal and external, or project-related and environment-related. Risk identification entails recognizing the events that may bring unwanted effects, thus identifying potential risks. Calculation of the risk exposure, computed as the risk probability and impact multiplication product, enables collation of the various risks within a project. The risk exposure costs are utilized in the creation of a risk priority record; this is then used to determine the appropriate response to each risk. Risk response which includes mitigation may produce new events that affect the project adversely – these events also require identification, analysis and anticipation. The risk management process is thus cyclical in nature and an integral part of overall project management. The risks were categorized in nine categories to shape the responses for the findings as Internal (owner risks, designer risks, contractor risks, sub-contractor risks, supplier risks) and external (political and government risks, market risks, natural risks, social and cultural risks) which is the gap being filled in this study. The study was designed to assess the probability of occurrence, and impact of these risks and how they are interpreted.

8. References

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