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A STUDY OF RISK MANAGEMENT IN THE CONSTRUCTION INDUSTRY

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ABSTRACT

Economic growth and socio-economic development are particularly important for developing countries; and the construction industry plays a central role in driving both of these. The general situation observed currently in building construction in a developing country such as India is that the output of a construction company is usually characterized by poor quality work, cost and time overruns. Construction projects are initiated in complex and dynamic environments resulting in circumstances of high uncertainty and risk, which are compounded by demanding time constraints. Construction industry has changed significantly over the past several years. Risk management is thus in direct relation to the successful project completion. Project management literature describes a detailed and widely accepted risk management process, which is constructed basically from four iterative phases: risk identification, risk estimation, risk response planning and execution, often managing the risk management process is included. Construction project planning is an essential element in the management and execution of construction projects which involves the definition of work tasks and their interactions, as well as the assessment of required resources and expected activity durations.

Keywords: Risk Assessment, Risk Management, Construction

I. INTRODUCTION

Buildings have been considered as one of the most valuable assets of a nation to provide people with shelter and facilities for work and leisure. Building construction projects have been identified as one of the most dynamic, risky and complex endeavors. An overview of the traditional construction process can be explained in four simple stages: conceptual design, construction, operation and maintenance. However, the passage from one stage to another is not all “smooth- sailing”, but fraught with problems. The cost of risk is a concept many construction companies have never thought about despite the fact that it is one of the largest expense items. Risk can be managed, minimized, shared, transferred or accepted. It cannot be ignored. Risk management helps the key project participants - client, contractor or developer, consultant, and supplier - to meet their commitments and minimize negative impacts on construction project performance in relation to cost, time and quality objectives.

Construction projects are initiated in complex and dynamic environments resulting in circumstances of high uncertainty and risk, which are compounded by demanding time constraints. Construction industry has changed significantly over the past several years. It is an industry driven primarily by private investors; the presence of

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securitized real estate has increased considerably. It is vulnerable to the numerous technical & business risks that often represent greater exposures than those that are traditional. Thus risk assessment need arises. Risk assessment is a tool to identify those risks in a project and manage it accordingly with proper treatment. Risk assessment is defined in this study as a technique that aims to identify and estimate risks to personnel and property impacted upon by a project.

II. CONSTRUCTION PROJECT RISK

Risk is a complex phenomenon that has physical, monetary, cultural and social dimension. Risk is the probability of occurrence of uncertain, unpredictable and even undesirable events that would change the prospects for the profitability on a given investment. Managing risk is to minimize, control and share risk and not just pass them off unto another party. Project in controlled environment describes risk as the chance of exposure to the adverse consequences of future events. Consequently, Smith et al states that risk exists when a decision is expressed in terms of a range of possible outcomes and when known probabilities can be attached to the outcomes. A construction risk is a variable in the process of construction, whose occurrence results in uncertainty as to the final cost, duration and/or the quality of the project.

However, the environment in which decision- making takes place can be described in three methods, which include certainty, risk and uncertainty. Certainty exist only when one can specify exactly what will happen during the period of time covered by the decision and conform to the specific requirements of certainty. However, this does not happen in the construction industry. Making a distinction between uncertainty and risk is necessary in order to be able to explain the influence of these on project performance.

Risks can be viewed as business, technical, or operational. A technical risk is the inability to build the product that will satisfy requirements. An operational risk is the inability of the customer to work with core team members. Risks are either acceptable or unacceptable. An acceptable risk is one that negatively affects a task on the non-critical path. An unacceptable risk is one that negatively affects the critical path. Risks are either short or long term. A short-term risk has an immediate impact, such as changing the requirements for a deliverable. A long-term risk has an impact sometime in the distant future, such as releasing a product without adequate testing. Risks are viewed as either manageable or unmanageable. A manageable risk is one you can live with, such as a minor requirement change. An unmanageable risk is impossible to accommodate, such as a huge turnover of core team members. Risk factors for this study are classified into eight categories namely.

- Construction risk
- Design risk
- Environmental risk
- Financial risk
- Management risk
- Political risk
- Procurement risk
- Sub-Contractors risk
- Technology risk

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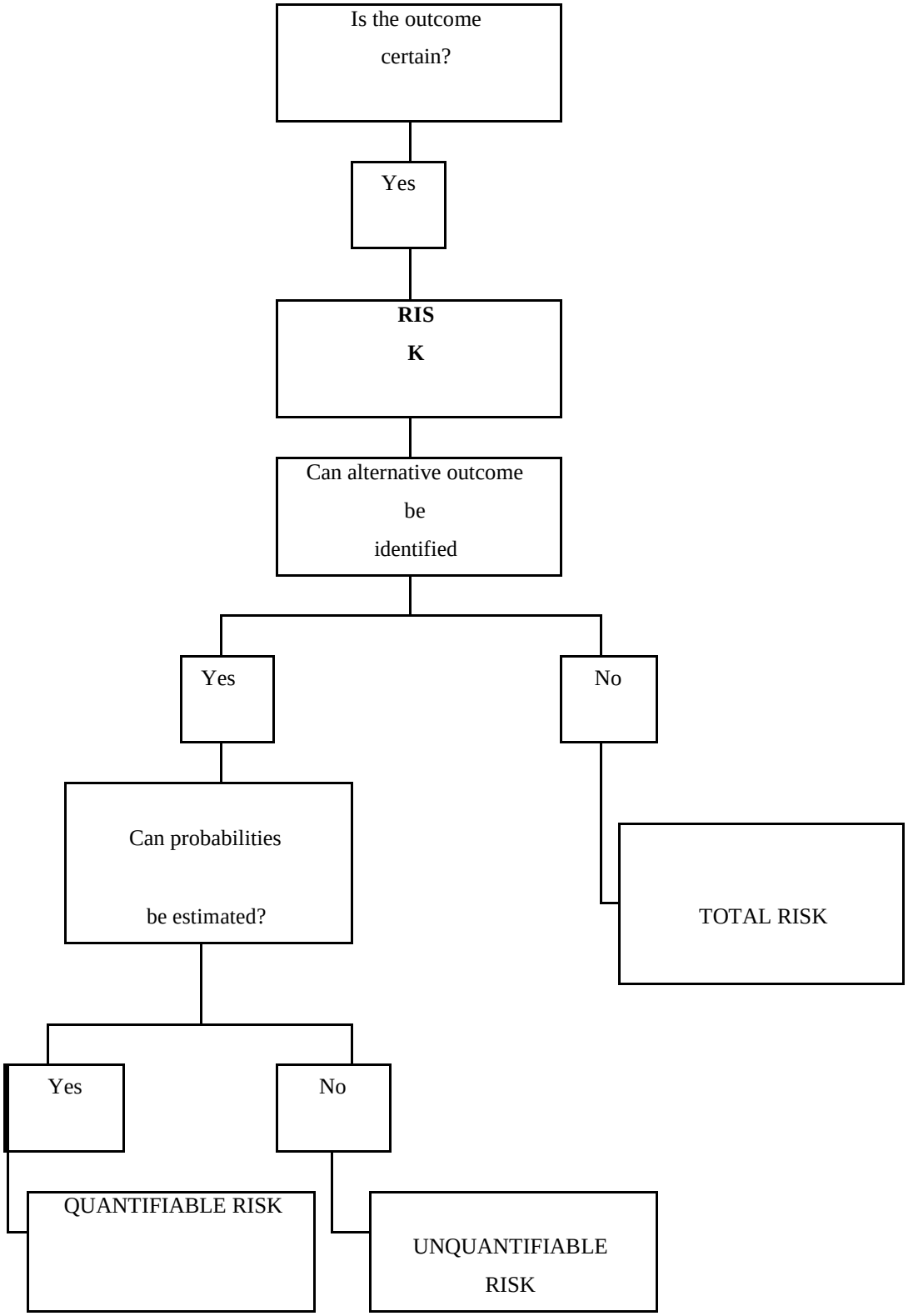

Figure 1. A holistic view of project risk

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III. RISK MANAGEMENT PROCESS FOR BUILDING CONSTRUCTION PROJECTS

Building projects in developing countries have constantly faced great difficulty in controlling time and cost overruns. An example of poor construction performance can be found in the Indian construction industry. The research conducted shows that the performance of the building construction industry in India has consistently been a source of concern to both public and private sector clients. The study conducted on some 12 building projects executed by the federal government of India through the federal housing authority, state housing corporation, Oyo state ministry of works and housing, and Lagos state property development corporation (LSDPC) concludes that the performance of building projects in terms of cost and time parameters is least satisfactory.

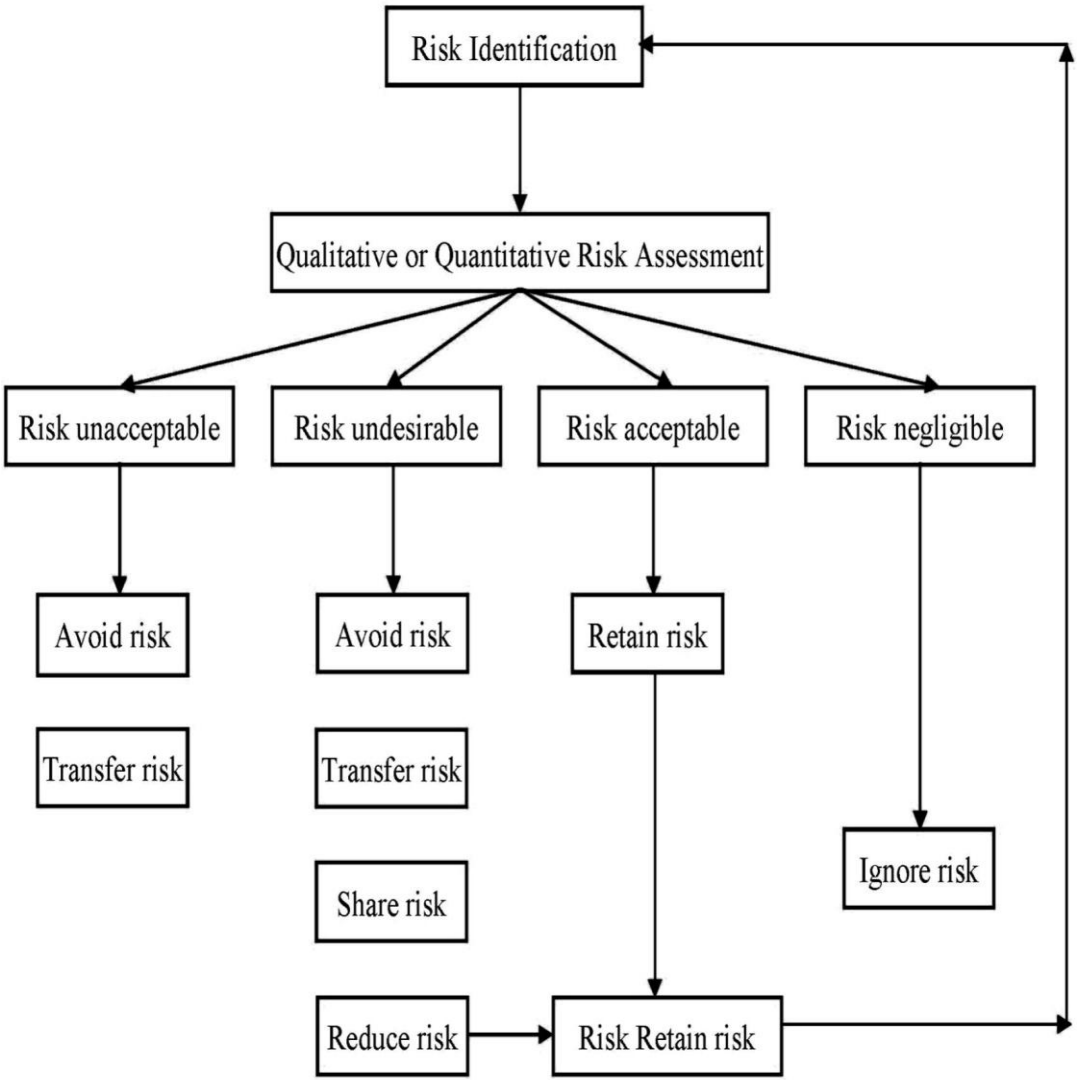

Figure 2. Cycle of risk management process

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IV. RISK MANAGEMENT AND ITS TYPE'S \

Table 1. Risks Factors of Building Construction projects

Risk group	Risk factors
Physical risk	Occurrence of accident because of poor safety procedures Supplies of defective materials Varied labour and equipment productivity
Design risk	Defective design (incorrect) Not coordinated design (structural, mechanical, electrical, etc.) Inaccurate quantities
Logistics risk	Unavailable labour, materials and equipment Undefined scope of working High competition in bids Inaccurate project program Poor communication between the home and field officers (contractors side)
Financial risk	Inflation Delayed payment in contracts Financial failure of the contractor
Legal risk	Difficulty to get permit Ambiguity to work legislations Legal disputes during the construction phase among the parties of the contract Delayed dispute resolutions No specialized arbitrators to help settle fast
Construction risk	Rush bidding Gaps between the implementation and the specification due to misunderstanding and specification Undocumented change orders Lower work quality in presence of time constraints Design changes Actual quantities differ from the contract quantities
	Segmentation of construction process

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Political risk	Working at hot (dangerous) areas New governmental acts or legislations Unstable security circumstances (invasion) closure
Management risk	Ambiguous planning due to project complexity Resource management Changes in management ways Information unavailability (include uncertainty) Poor communication between involved parties

Risk management is a management discipline whose goal is to protect the asset, reputation, and profits an organization by reducing the possible losses or damages before they occur. Risk management is one of the nine knowledge areas (i.e., integration management, scope management, time management, cost management, quality management, human resource management, communications management, risk management, and procurement management) propagated by the Project Management Institute. Zou et al describe risk management in the construction project management context as a systematic way of identifying, analyzing and dealing with risk as associated with a project with an aim to achieve the project objectives while Williams describe project risk management as an integrated process which includes activities to identify project uncertainty, estimate their impact, analyze their interactions, control them in the execution stage, and even provide feedback to the maintenance of collective knowledge asset.

V. CONCLUSIONS

As far as India is concerned risk management is still a new word in the construction sector and this should be changed as soon as possible. Currently the Government of India has proposed a risk rating system will help the developers to develop projects at a faster pace by taking quick decisions. Each rating agency will have its own methodology to rate projects. Construction projects are unique in terms of design, construction methods, personnel, location, etc. Variations in these factors will induce different types of risk factors into construction projects. In addition, risk factors could come from many different directions, such as social, legal, economic, environmental, political, logistic, management and technological sources.

The system will help government to develop a strategy to mitigating risk. This will encourage more response from developers and investors for public-private partnerships projects. It could make the bidding projects more competitive. The construction companies need to include risk as an integral part of their project management. Decision making such as risk assessment in construction projects is very important in the construction management. The identification and assessment of project risk are the critical procedures for projecting success. This study determines the key factors of risk in construction industry.

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