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Analysing and Proposing a Module for Managing Major Risks in Construction Projects Based on Process Protocol

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Abstract:

Risk and uncertainty are inherent in all the phases through which the construction project passes, from demonstrating the need for operation and maintenance.

This project identifies the different areas of risk & describes the development of a systematic approach to risk management in construction project based on process protocol, whose applications in construction practice would lead to changes & improvements in the construction industry.

The construction project passes according to process protocol. Key risks are identified in the framework, which are independent of size, type & purpose of the project being realized. Project related risks should be separately identified for each specific project. Depending on available data, quantitative & qualitative analysis is carried out for the identified risks, their risk probability & risk impact are determined and the corresponding risk exposure is calculated. Then the adequate risk response is given for each identified risk, depending on its exposure. As the process unfolds new risks appears in each phase & the risk management process begins anew.

Keywords: Protocol, risk exposure, risk impact, risk probability, risk management

1. Introduction

Construction is the second largest industry in India. The industry has many specific features and is inert, because of which it lags behind other industries in keeping to deadlines & realizing production with minimum expenses & satisfactory quality, in other words, in developing an efficient production process.

Every construction project passes through phases, each of which has a purpose, duration & scope of work. Risk and uncertainty are inherent in all the phases through which the construction project passes, from demonstrating the need to do operation & maintenance. Latham (1994) said that no construction project is risk free. Risks are very common in construction sector.

Risk is the possibility of suffering loss & the impact on the involved parties. Risks identified and the risk assessment & risk analysis is done. Risk can be managed, minimized, shared, transferred or accepted. It cannot be ignored.

In this project the risks are identified, among those risks major are taken into an account. These major risks are identified through questionnaire survey from 56 companies.

To improve risk management developing quantitative & qualitative risk analysis techniques and use them in particular phases of project life cycle.

The systematic analysis of risk management, risk in construction & process in construction. This led to conclusion that realising a construction project is a process and that risk management process should be subordinated to the construction process.

2. Objective

- To investigate how to deal with risks and uncertainties in each phase of the project.
- To investigate and assess key risks in each phase of the project.
- To analyse, develop and to provide a systematic approach for managing major risks in constructions industry.

3. Scope

- The proposed analysis of process protocol management can be applied to all types of construction project regardless of their size & type.

- The proposed approach to risk management may also be extended to the other industries if the plan of work is adapted to their construction process.
- It could be used for quantitative analysis of the identified risks and at the same time provides for qualitative analysis

4. Process of Risk Management

Risk management is a discipline for living with the possibility that future events may cause adverse effects. The basic goal of project management is to realize the project within the predicted time, planned costs & satisfactory quality. When the outcomes of all foreseen events cannot be predicted with certainty. This is necessary to turn uncertainty into risk, and to manage that risk.

The risk management process may consist of elements more or less closely connected. It consists of three phases.

1. Risk identification
2. Risk analysis
3. Risk response

5. Qualitative and Quantitative Assessment

The data collected manually are fed into Microsoft excel & then the respective probability level of risk occurrence and degree of impact are calculated and finally the total risk is arrived.

The questionnaires were distributed to the respondents through direct contact in order to supply the necessary data to be used for the project work. Responses were collected on individual basis and also interviews were conducted with respondents in respect of questionnaire distributed.

Questionnaire is the main mode of data analysis considered in phase of the project. The analysis of the collected data was made by using qualitative and quantitative analysis by using Microsoft excel. Excel is a window based program that can be used to perform data entry and analysis and to create tables and graphs. Excel is capable of handling large amounts of data and can perform all the analysis. All the data collected from 56 samples were provided as input for the software and the analysis is arrived by considering probabilistic level of risk occurrence and degree of impact.

The questionnaire was designed by giving options. They are SMALL, NORMAL, LARGE, VERY LARGE and LOW, MEDIUM, HIGH, VERY HIGH.

6. Results and Discussions

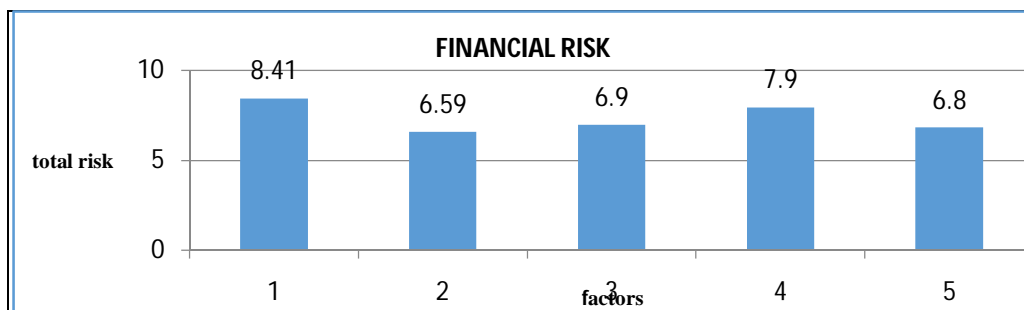


Figure 1

In this graph, type1 is having major risk factor 8.4. so, it is considered as a major risk which means most of the companies agree that type1 factor affect the project.

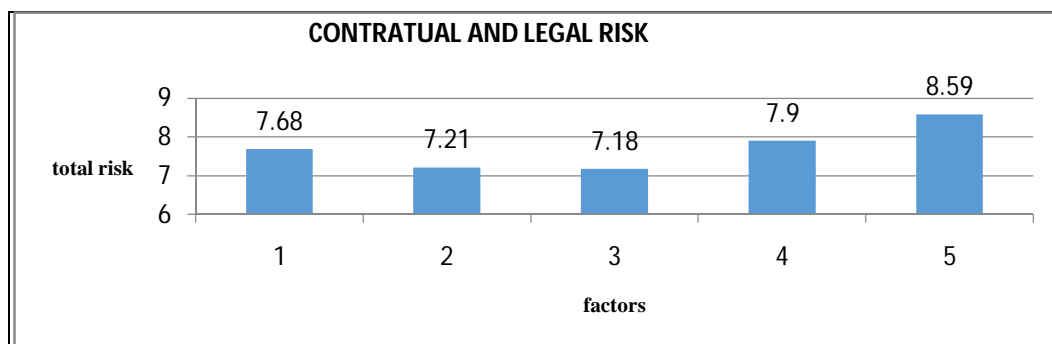


Figure 2

In this graph, type1 is having major risk factor 8.59. So, it is considered as a major risk which means most of the companies agree that type5 factor affect the project.

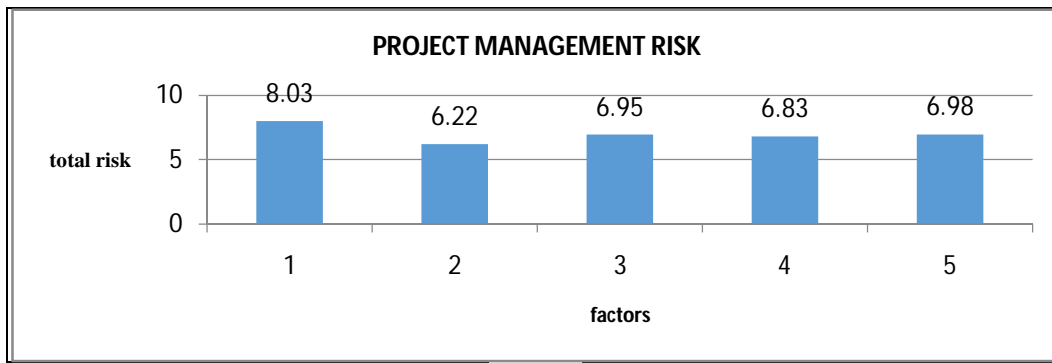


Figure 3

In this graph, type1 is having major risk factor 8.03. So, it is considered as a major risk which means most of the companies agree that type1 factor affect the project.

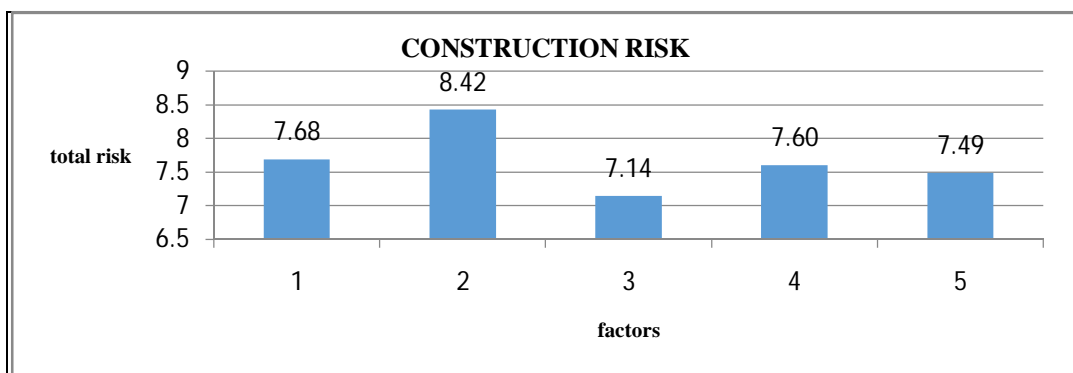


Figure 4

In this graph, type2 is having major risk factor 8.42. So, it is considered as a major risk which means most of the companies agree that type2 factor affect the project.

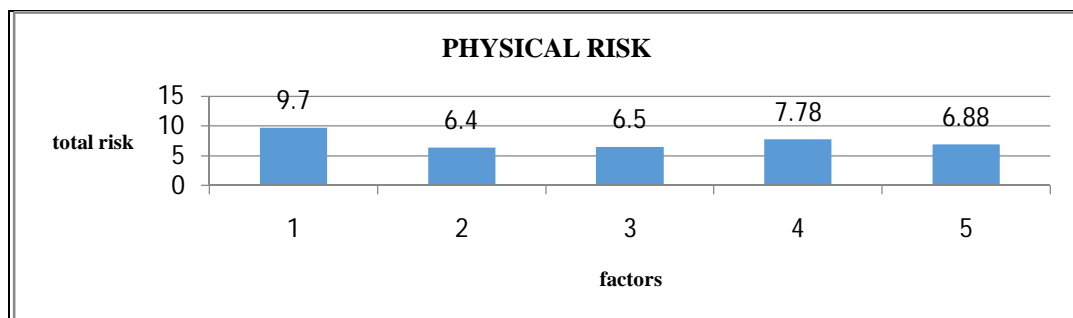


Figure 5

In this graph, type1 is having major risk factor 9.7. So, it is considered as a major risk which means most of the companies agree that type1 factor affect the project.

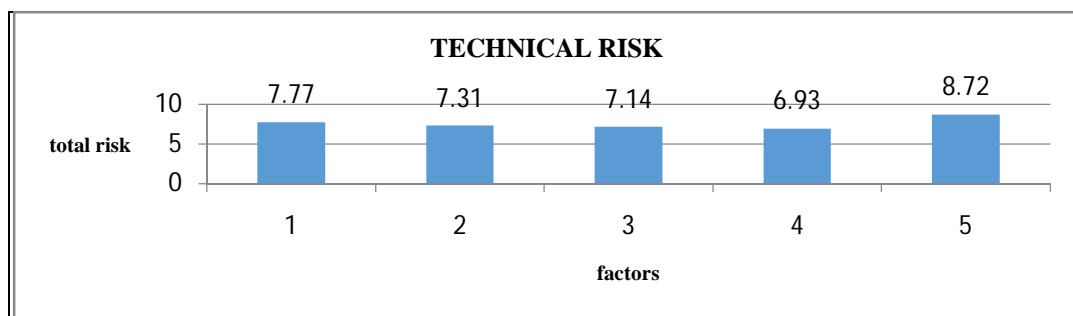


Figure 6

In this graph, type5 is having major risk factor 8.72. So, it is considered as a major risk which means most of the companies agree that type5 factor affect the project.

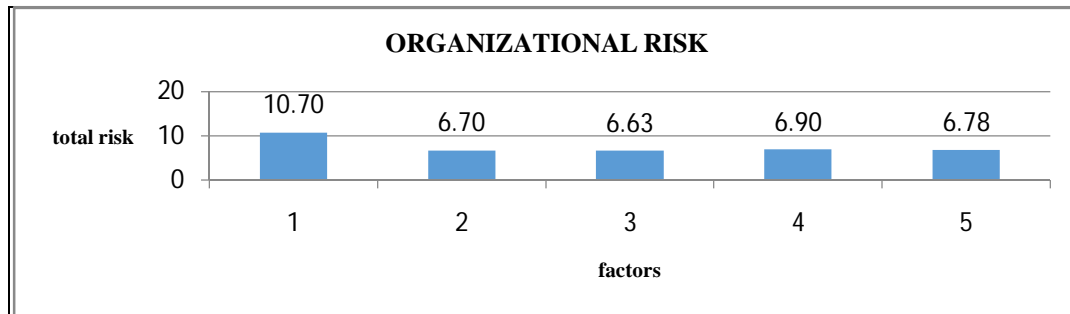


Figure 7

In this graph, type1 is having major risk factor 10.70. So, it is considered as a major risk which means most of the companies agree that type1 factor affect the project.

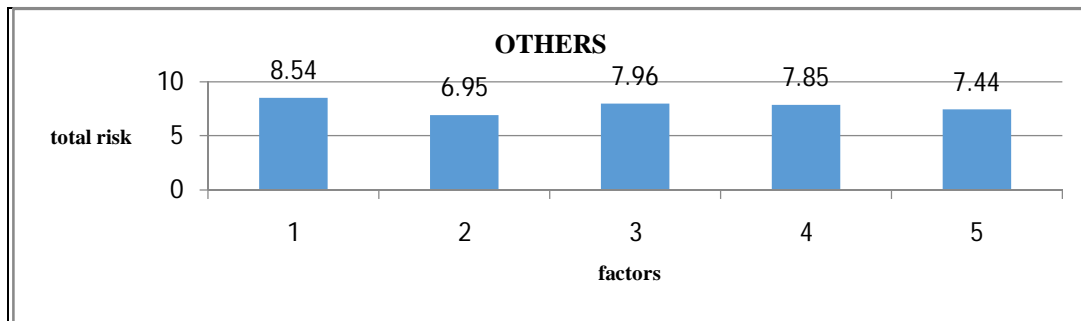


Figure 8

In this graph, type1 is having major risk factor 8.54. So, it is considered as a major risk which means most of the companies agree that type1 factor affect the project.

8. Conclusion

This paper revealed that the uncertainties are converted into risks. Those risks can be minimised using qualitative and quantitative analysis. Risk is the possibility of suffering loss & the impact on the involved parties. Risks identified and the risk assessment & risk analysis is done. Risk can be managed, minimized, shared, transferred or accepted. It cannot be ignored.

The above mentioned causes of risks can be minimised by adapting the process protocol.

9. References

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Appendix

The purpose of questionnaire is to obtain a professional opinion of clients, consultants and contractors on causes of risk in construction. This is to identify the major causes for the occurrence of risk and rank them on the basis of importance.

The questionnaire has two sections. Section A seeks the probability level of risk occurrence in various aspects. In section B, the degree of impact or the level of loss if the risk occurs have been listed. Next to each cause there are options like small, normal, large, very large.

In section A & B please tick on the appropriate boxes to give the information of the risk probability level of occurrence and degree of impact of the listed causes.

S. no	Factors	Probability level of risk occurrence (A)	Degree of impact (B)	Total risk (A*B)
1	FINANCIAL RISK			
1.1	Completion of the project has generated proposed revenue?			
1.2	Loss due to fluctuation of interest rate in the project			
1.3	Creditability of share holders and lenders related to the project			
1.4	Inadequate hedging of revenue streams and financing cost are..... in construction project?			
1.5	Projects are sensitivity to the changes due to their capital intensive			
2	CONTRACTUAL AND LEGAL RISK			
2.1	Any type of contractual risk without agreement is?			
2.2	Possibility of legal practices due to any type of conflict are			
2.3	Difficulty due to lack of enforcement of legal judgment are			
2.4	Improper verification of contract documents creates difficulties			
2.5	Chance of incompletion of project due to legal actions from any party is			
3	PROJECT MANAGEMENT RISK			
3.1	Project management factors affecting project success are			
3.2	Change of top management affects are in projects			
3.3	Project risks do not have Importance as others in terms of affecting competitiveness in the project sector.			
3.4	Project completion risk is risk in any project			
3.5	Internal management problems are in company.			
4	CONSTRUCTION RISK			
4.1	Adequate knowledge of construction has Impact on project			
4.2	Due to improper construction knowledge it creates Risk in completion of project			
4.3	Availability of labor isdifficulty.			
4.4	Availability of machine is.....difficulty			
4.5	Equipment commissioning has affect on equipment cost			
5	PHYSICAL RISK			
5.1	Soil investigation before design of the project plays			

 Role for the life span of project			
5.2	Topography consideration for a project is task			
5.3	Construction of members of the project has to be paid intension			
5.4	Natural disaster has impact on the life span of the project			
5.5	Proper testing and commissioning plays role for completion of the project			
6	TECHNICAL RISK			
6.1	The factor constitutes technical risk is having new technology applied in the facility			
6.2	The technology is considered as having a significance performance risk			
6.3	The seismic criteria has Impact on the designed building			
6.4	Technical risk have importance as others in terms of affecting competitiveness in the sector			
6.5 Engineering and technical services are required for goal achievement in the project			
7	Organizational risk			
7.1	Organizational changes in a structure and processes have probability level on project			
7.2 increment of common vision among in the organization plays a vital role			
7.3	Non communication between the personnel have improvement in the project			
7.4	Inadequate skillful workers have Progress			
7.5	Making correct organizational chart in term of project is task			
8	Others			
8.1	Force majeure risks are risk			
8.2 environmental risk are related with project completion			
8.3	Non guarantees from the Govt. to promote private forms have Potential project risks			
8.4	Private firms may invest in projects that are ----- prone to fail also.			
8.5	Services to be provided from authorities to complete the project becomes -----risk if not communicated on time.			