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EFFECTIVENESS OF RISK MANAGEMENT AND CHOSEN METHODS IN CONSTRUCTION SECTOR

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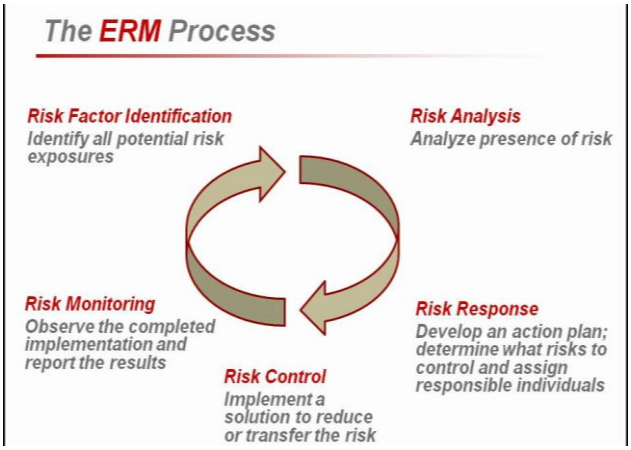
Abstract: *Risk analysis is the most important aspect for the selection of any project and maintenance of co-ordination in construction sector. In general risk is basically the deviation from what is normal, the expected level. Risk is indeed considered as a central part of uncertainty, in which the probability occurrence and amount of damage can be determined. Risk management is area which requires tremendous emphasis and comprehensive approach by the various aspects or participants of the sector. With the growing economy the construction industry in India has gained enormous attention and poised for exceptional growth prospectives. This paper puts forth an attempt to bring out the importance of risk management and the analysis and risk management processes that should be undertaken for the improvement of the construction industry in the long-run. Result analysis and a short survey made in this regard has been included which gives an overview about the current practices relevant in the construction industry. An efficient and effective risk management approach requires a systematic methodology including knowledge and experience about the construction works. Analysing the risk is often considered as analysing the adverse consequences during the stage of planning and programming of construction project. The risk management analysis not only enhances the decision-making process but also provides additional information which helps to select the optimal aspects of the construction project.*

Keywords: **Risk Analysis, Risk management, Uncertainty, Systematic methodology, Adverse consequences, Decision-making process, Optimal aspects.**

1) INTRODUCTION:

The phenomenon of risk is the most important subject of discussion for both theorists and practitioners. However, only a few fraction of them realize the adversity and undertake these problems in order to formulate the problematic situations within the procedural framework. Presently the construction industry occupies such a position which has considerably caused the increase in employment generation. Amidst such an encouraging situation, the industry is still in the phase of many challenges which faces limitations in aspects like construction material, financial resources, human resources, construction methodologies. Due to the rapid growth in the infrastructure of the project huge quantum of various resources and the nature of the complexities of project, the management of risk plays a vital role in the construction sector. Risk management can be considerably improved by improving the performance and the knowledge of labours, machinery, money, materials etc. which facilitates the entire construction industry. This paper outlines the important areas of risk management in the construction industry and aims at presenting the three methods used for the analysis of risk and simultaneously pointing their features and characteristics by highlighting the degree of credibility of the discussed problems. The presented methods involve solved decision-making and the usage of the data by taking into consideration common features as well as specific individual features of each one of them. Risk being considered as a measureable part of uncertainty is most often considered as possibility of incurring heavy losses. The scope and the number of problems associated with risk management, taking into consideration the realization of the project is enormous before we delve into analysis of risk, we should find answers to the required three questions. Risk management being a considerably vast aspect, should therefore be segregated into 3 general forms which are:

1) Risk Identification
2) Risk Assessment
3) Measuring and controlling the reaction of risk



Risk management in construction industry

According to various publications the popularity of the methods to clearly identify risk is based on various aspects like the degree and quality of the obtained results, verifications and specifications used in the project, degree of complexity of calculation, use oof computer softwares. The mentioned methods are illustrated and outlined at a same time, taking into consideration their characteristic feature in terms of their analysis.

Characteristics of the methods stated:

- Requirement of necessary flexible approach, taking into consideration some additional factors by keeping in mind the specific list of problems and hazards for each project.
- Limited scope or approach and inaccessable information in the long-run.
- Based on the selection of criterion and information in the process of decision-making, the accomplished grades results are thoroughly obtained from the same.

2) Methods chosen for identifying risks in construction project:

Identifying the risk involved in construction project:

During identification stage various factors are noted which are possible to occur during the entire cycle of the project. The following methods for identification of risk factors which are most frequently used are the Delphic Technique, the brainstorming, the checklist method.

Now we will take a look at the suitability, limitation, strength and weaknesses of all the risk identification techniques Delphi technique, brainstorming and the checklist. Before using all these three methods various types of risks were classified and taken into consideration like for example: 1) Technical risks: which are mostly associated with complex and advanced techniques,equipments,materials.2)Construction risks: which are mainly associated with site precautions and safety, workers safety, environmental conditions ,geotechnical conditions, construction procedures. 3) Financial risks: these are mainly associated with economic conditions, market instability, political conditions and interference, exchange rates etc.

The table below shows the strengths and weaknesses or limitations of the three risk identification methods:

STRENGTHS	**BRAIN STORMING**	**DELPHI**	**CHECKLIST**
Short duration for setting up the structure.	**y**		**y**
Anonymous ideas		**y**	
Short time taken to identify risks			**y**
Encouraging innovative thinking.	**y**		
Managing and enabling interaction between people from different regions and areas.		**y**	
Forecasting	**y**	**y**	
Encouraging interactive communication and group thinking between the participants.	**Y**		
Enabling participants to take their own time for analyzing and observing the problems.		**y**	
LIMITATIONS			
Inability of group interaction and group thinking		**y**	**y**
Long-time duration for setting up the structure		**y**	
Improper behaviour of the participants that increases the possibility of risks.	**Y**		
Taking a long time to achieve results and coming to a end conclusion.	**Y**		

TABLE.1 (Symbol y signifies "yes")

Suitability factor for risk identification:

Simple projects	Complex projects					
	F	C	T	F	C	T
Brainstorming	M	M	H	L	M	M
Delphi	H	L	M	L	M	L
Checklists	M	H	M	L	M	L

TABLE.2

M: moderate suitability, L: low suitability, H: high suitability, F: financial risks, C: construction risks, T: technical risks.

3) Chosen method for risk assessment in construction sector.

Assessment of risk in construction industry:

The analysis or the assessment stage of the risk takes into consideration various factors like degree of impact of risk on construction sector, possibility of their occurrence. The methods and tools for analysis and estimation of risks, which are generally used are probabilistic methods and probability theory, sensitivity analysis, decision making methods, computer simulation , cost benefit analysis, the fuzzy sets or fuzzy logic model, neutral networks approach etc. Of all these methods the most significant is the fuzzy sets method.

The fuzzy system enables us to deal with confusing information and has ability to explain and make understand the reasoning process which is of vital importance in the field of the risk assessment. In brief fuzzy logic model is used for the examination and assessment of risk.

The fuzzy process can be divided into three steps:

a.) Fuzzification
b.) Fuzzy interference
c.) Defuzzification

The entire fuzzy method can be explained in simple basic steps;

1.) Surveying and studying the risk related data and information.

2.) Measuring risk criteria for analyzing risk magnitude.

3.) Filling of design criteria values into fuzzy decision network. Fuzzy decision network is mainly divided into two main processes i.e fuzzification and aggregation.

4.) Inputting the aggregation criteria into fuzzy interference system.

5.) Last is defuzzification process.

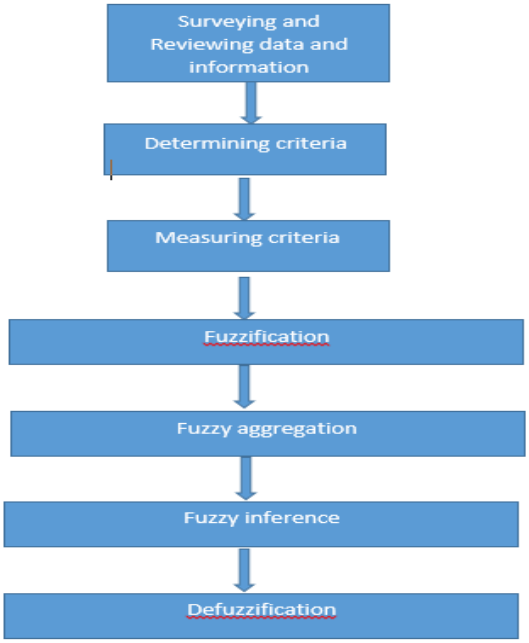


Chart of fuzzy network

4) Controlling and managing risk in construction industry.

The main aim of risk management is to determine the undesirable factors and aspects which leads to cause serious adversities and impacts time, size of the construction project and meanwhile developing alternatives and undertaking probable methods that will in turn reduce the effect of risk on construction industry which will further facilitate smooth running of the project. At the final procedural stage it is desirable to adopt response strategies which will help in minimizing damages of the undesirable events and reduce its consequential reaction on the project.

5) CONCLUSION:

The process of combating the problems of risk management is very essential for effective planning and organising of any construction project in any sector. During this process, one must undertake the most appropriate method of risk identification and risk assessment. One can definitely be guided by the reliability and usefulness of the method in analyzing and examining the problems in risk management. The risk management requires a flexible approach to analyze and

combat the adverse effects of risk factors and also requires brief description about the mechanisms involved during the duration of the project in the construction organization. Also the most appropriate method chosen should be such that it is easily available and feasible under any possible circumstances.

Many methods are used for evaluating and examining risk identification and risk assessment in risk management, but the most important and generally used ones are specified and explained in the paper above which are the Delphi method for risk identification and Fuzzy networks for risk assessment. However, degree of difficulty and scope of application depends upon the feasibility of the construction project and degree of risk factor influencing the risk management. Hence considering the feasibility of each and every method under different conditions the process of identification and assessment of risks should be carried out by making use of the most appropriate method possible since risk management is the most integral part of project management in construction industries.

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