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Analytical Study of Risk Analysis and Role of Project Management in Construction Industry

M. Ramesh[1], K. Soundhirarajan M.E[2]
[1]*PG Student,* [2]*Head of the Dept., Construction Engineering & Management, Gnanamani College of Technology, Namakkal, Tamilnadu, India*

Abstract: ***The objective of this research is to study the risk analysis and project management in construction industry. The benefits of risk management are not confined to large or risky projects. The process may be formalized in these circumstances, but it is applicable for all scales of project and procurement activity.***
It can be applied at all stages in the project cycle, from the earliest assessments of strategy to the supply, operation, maintenance and disposal of individual items, facilities or assets. This study stressed on many aspects on the subject of project management in terms of problems and impediments, and suggested solutions through this project, in order to motivate and develop the management of the projects.
It project is involves stage by stage construction industry facing issues and its solutions by various approaches like Questionnaires, qualitative method and quantitative method etc... Aim of this project to investigate the current level of application of project management and the obstacles that have prevented its introduction in the Indian construction industry. Then the exploitation of each project will be documented and used in future work.
Keywords: Risk Analysis, Risk management, Project cycle, Questionnaires, qualitative method and quantitative.

I. INTRODUCTION

Construction Management is not a new idea. The function of the Construction Manager is to work on behalf of the owner to complete a project within the plans and specifications provided. In the last few years construction practices have changed dramatically.

Technology, materials, government bureaucracy, financing, design, and engineering have all advanced. With the complexity of the construction process increasing, owners demand accountability and accurate guidance during the entire planning and construction process.

Tools that can automate often support the application of a risk analysis technique. The main role of the tools is to allow for searching, gathering and managing the necessary data for the various project phases. Various techniques use different types of data and information collected from a wide range of sources using different tools, such as statistics, inspections, surveys, documentations and expert judgments. Project risk analyse techniques can be classified into two main categories, namely qualitative and quantitative techniques.

II. METHODOLOGY

This chapter shows an overview of the methodological approach for studying risk analysis and project management, through studying the current situation in contracting companies, and through studying project management in various project; this is empowered by the literature review which will help for selecting the way to conduct the analysis.

This thesis also provides a wide view of the interviews, the targeted population, the samples used and the analysis and evaluation of the survey followed by the framework designed that will help in organizing the management of construction projects, and the conclusions of the interviews and of this study.

1) First Stage - Literature review.
2) Second Stage- Questionnaire Survey, Interview Conduction, Data analysis & Interpretation.
3) Third Stage – Frame work Design and Conclusion.

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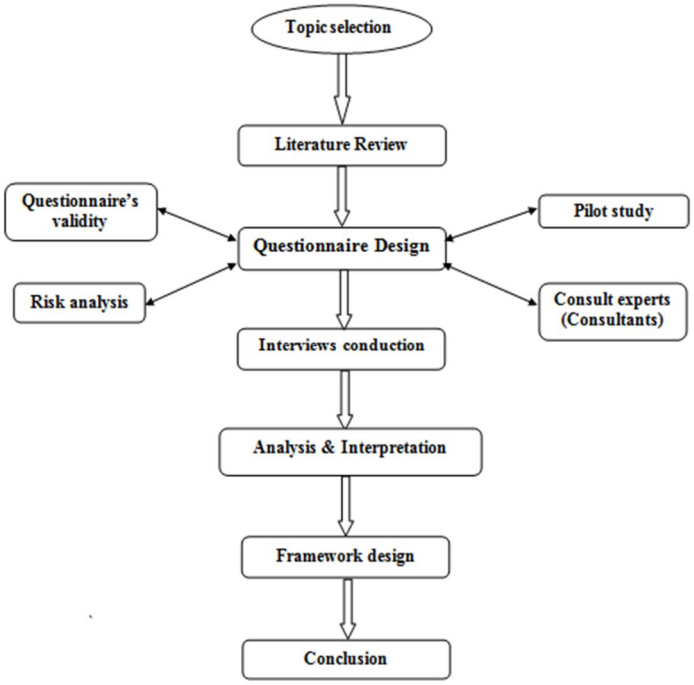


Figure.1 Methodology Chart

A. Questionnaires Design

Questionnaires design is frequently used in quantitative marketing thesis and social thesis. They are a valuable method of collecting a wide range of information from a large number of individuals, often referred to as respondents.

B. Interviews Analysis : (Quantitative And Qualitative Approaches)

As the table showed, Quantitative method is used to predict and measure to achieve final course of action, while qualitative is used to understand thoughts, opinions and construct a basis for decision making, and for the purpose of this thesis used qualitative method mainly and quantitative method when needed to help more in completing the picture.

C. Data Analysis And Interpretation

A detailed analysis of the study is necessary and is to be considered in order to compare the actual theory with that practical the variants of which may form the basis for improvements. Keeping this point in view and to fulfill the evaluation variants of which may form the basis for objectives of the studies an attempt has been made to segment the various respondents on the basis of some aspects collected from them through questionnaire. There are depicted through tables.

The copy of questionnaire administered with few companies and the sample size was 20 respondents. All the calculations and numerical interpretations are for 100%

D. Risk Analysis

Q1.Have you read any courses in Risk Management and how knowledgeable are you in this area?

Table - 1

Criteria	Frequency	Percentage
Yes	06	30 %
No	14	70 %

Analysis & Interpretation: The respondents' answers varied somewhat, approximately 30% stated that they have taken courses in risk management while 70% of the respondents didn't.

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Q2. Statement: “My organization has a clear risk identification process”

Table - 2

Criteria	Frequency	Percentage
Agreed	7	35%
Partly agree	10	50%
Partly disagree	3	15%
Completely Disagree	0	0%

Analysis & Interpretation: The majority of the respondents at approximately 50% answered “partly agree” while 35% agreed completely on the statement and 15% partly disagreed. No respondent answered “completely disagree” or “don’t know”.

Q3. Which Risk Assessment method do you use?

Table - 3

Criteria	Frequency	Percentage
Risk register	4	20%
Risk matrix	6	30%
Impact assessment	7	35%
Any method	2	10%
No method	1	5%

Analysis & Interpretation: The respondents chose probability and impact assessment at approximately 35%, followed by risk matrix at 30% and risk classification or risk register at 20%, as can be seen in implementation of any method ended up at 10% while the option of “don’t know” and “other” ended up at 5% each.

Q4. Which stage/phase do you consider most important for Risk Management?

Table - 4

Criteria	Frequency	Percentage
Conceptual stage	2	10%
Planning stage	12	60%
Execution stage	6	30%
Completion stage	0	0%

Analysis & Interpretation: Findings showed a pattern where the majority considered the planning phase as the most important phase to implement risk management. Followed by execution, then conceptual phase and lastly the completion / closeout phase.

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Q5. Which Risk Management process is most important?

Table - 5

Criteria	Frequency	Percentage
Risk identification	10	50%
Risk assessment	3	15%
Risk response	2	10%
Risk monitoring	5	25%

Analysis & Interpretation: Risk identification was perceived by the respondents as the most important risk management then followed process Risk assessment, risk response and risk monitoring phase was considered rather equally important with small variances in opinion.

Q6. Does your organization provide any education / classes in Risk Management?

Table - 6

Criteria	Frequency	Percentage
Yes	14	70%
No	06	30%

Analysis & Interpretation: Approximately 70% of the respondents said that their organization offers risk management education while 30% doesn't. However, the quality of the education offered by the organizations varied, the questionnaire consisted.

Q7. How efficient are the communication regarding risks in your construction projects?

Table - 7

Criteria	Frequency	Percentage
Completely agree	03	15%
Partly agree	15	75%
Partly disagree	02	10%

Analysis & Interpretation: The majority of the respondents at approximately 75% chose the option of "partly agree" for the following statement: "We have good and effective communication concerning risks in our projects". The option to "completely agree" with the statement was chosen by 15% of the respondents while approximately 10% chose the option of "partly disagree". However, a difference can be observed related to the size of the construction companies. The results indicate that larger companies with more than a thousand employees where overall less satisfied with the communication regarding risk, compared to the smaller companies.

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Q8. How do you personally identify risks?

Table - 8

Criteria	Frequency	Percentage
Experience	14	70%
Knowledge	2	10%
Analysis	4	20%

Analysis & Interpretation: Approximately 70% of the respondents stated that they identify risks by experience, 20% was using analysis for risk identification and 10% chose knowledge.

Q9. Is your organization maintaining risk register for every project?

Table - 9

Criteria	Frequency	Percentage
Yes	08	40%
No	12	60%

Analysis & Interpretation: Approximately 40 % of the respondents stated that maintaining stock register “Yes”, 60 % said “No”.

Q10. Mostly risks occur due to?

Table - 10

Criteria	Frequency	Percentage
Poor material	2	10%
Poor equipment	1	5%
Lack of time	4	20%
Money	8	40%
Poor labor	2	10%
Natural disaster	2	10%
Safety hazards	1	5%

Analysis & Interpretation: Money was perceived by the respondents as the mostly risk occurs then followed process lack of time, poor material, poor labour, natural disaster, poor equipment and safety hazards.

E. Project Management

Q11. Do you think that project management play very important role in Construction Industry?

Table - 11

Criteria	Frequency	Percentage
Yes	14	70%
No	6	30%

Analysis & Interpretation: 70% of think that project management play very important role in Construction Industry and 30% of respondent no category.

Q12. The project manager's leadership style should be matched to the corresponding developmental level of the project team and should move through successive steps in the following order:

Table - 12

Criteria	Frequency	Percentage
Disciplining	4	20%
Staff Planning	10	50%
Team Building	2	10%
Coaching	4	20%

Analysis & Interpretation: 50% Percentage respondents feels that project leadership comes from staff planning Where 20% feels its term the Discipline, where only 10% believe its Team building & 20% say Coaching. Most of the people believe the staff planning is the main thing for the project success & then is the discipline which Contributes to it. Only same people believe that Team building is also is also an important role of the HR.

Q13. Are you a member of the Construction Client Group?

Table - 13

Criteria	Frequency	Percentage
Yes	12	60%
NO	8	40%

Analysis & Interpretation: Out of the total respondent surveyed, there is mixed responses of respondent 60% of the respondent are member of the Construction Client Group, and 40% said no.

Q14. Project management is an effective and powerful strategy and should be implemented in construction Industry?

Table - 14

Criteria	Frequency	Percentage
Yes	16	80%
NO	4	20%

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Analysis & Interpretation: 80% respondents feel that the project management is the important issue with the success of the project where 20% is not.

Q15. Do you feel Project Management is necessary for every industry?

Table - 15

Criteria	Frequency	Percentage
Yes	12	60%
No	8	40%

Analysis & Interpretation: 60% respondents feel Project Management is necessary for every industry and 40% of respondent said no category

Q16. When should the project expeditor form of organization be used?

Table - 16

Criteria	Frequency	Percentage
When the project is extremely important to the organization.	6	30%
When a project's cost and importance are relatively low.	10	50%
When the project manager has a lot of responsibility and accountability.	2	10%
When the organization's primary source of revenue is derived from projects.	2	10%

Analysis & Interpretation: 30% of the project expeditor form of organization be used When the project is extremely important to the organization, 50% of respondent said when a project's cost and importance are relatively low, 10% of respondent said when the project manager has a lot of responsibility and accountability, and 10% when the organization's primary source of revenue is derived from projects..

Q17. Formal reporting and reviews violate the basic principles of project management because they.

Table - 17

Criteria	Frequency	Percentage
Are customers based and not project based	6	30%
Do not appear on the project schedule	10	50%
Do not occur frequently enough to avoid surprises	2	10%
Must be reviewed by a central project authority before being forwarded to the customer and top management	2	10%
None of the above	0	0%

Analysis & Interpretation: A large number of respondent formal reporting and reviews violate the basic principles of project management because they do not appear on the project schedule.

Q18. Planning and managing engineering, procurement construction services through project management.

Table - 18

Criteria	Frequency	Percentage
Yes	16	80%
No	4	20%

Analysis & Interpretation: Most of the respondent said Planning and managing engineering, procurement construction services through project management

Q19. Do you think that construction materials, elements, and modules are good maintained by project management?

Table - 19

Criteria	Frequency	Percentage
Yes	12	60%
No	8	40%

Analysis & Interpretation: 60% of think that construction materials, elements, and modules are good maintained by project management and 40% of respondent said no.

Q20. Do you think that project management in construction industry deliver good qualities materials to their customers?

Table - 20

Criteria	Frequency	Percentage
Yes	14	70%
No	6	30%

Analysis & Interpretation: It can be concluded that maximum number of respondent of the were think that project management for engineering, procurement and construction industry deliver good qualities materials to their customers and 30% are in no category.

F. Project Management Framework

Project management framework is how a project is managed from first steps to completion through a natural life cycle, the lifecycle of a project, the life cycle of any project includes: initiating, planning, executing with controlling and closing, supported with the main principles and tools to achieve the goals and to create success.

The process of developing a framework began with documenting the analysis taken from the people who are experienced in this field, and from the feedback taken through the interviews with project managers. A preliminary framework was designed according to the company analysis and observations, compared to the literature review, this frame work was designed reviewed and refined through an iterative process.

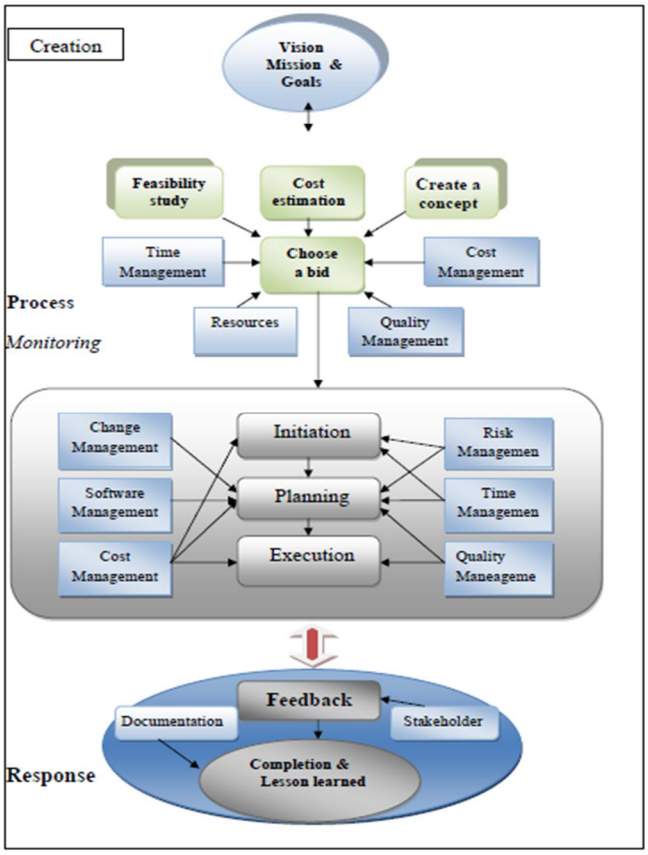


Figure.2 Project Management Framework Chart

III. RESULTS AND DISCUSSION

The findings of the study of "Analytical Study of Risk Analysis and Role of Project Management in Construction Industry"

A. Risk Analysis

1) The respondents' answered; approximately 30% stated that they had taken courses in risk management while 70% of the respondents never taken any risk management courses.

2) "My organization has a clear risk identification process" for that statement responders answered, the majority of the respondents at approximately 50% answered "partly agree" while 35% agreed completely on the statement and 15% partly disagreed. No respondent answered "completely disagree" or "don't know".

3) The respondents chose probability and impact assessment at approximately 35%, followed by risk matrix at 30% and risk classification or risk register at 20%, as can be seen in implementation of any method ended up at 10% while the option of "don't know" and "other" ended up at 5% each.

4) Findings showed a pattern where the majority considered the planning phase as the most important phase to implement risk management. Followed by execution, then conceptual phase and lastly the completion / closeout phase.

5) Risk identification was perceived by the respondents as the most important risk management then followed process Risk assessment, risk response and risk monitoring phase was considered rather equally important with small variances in opinion.

6) Approximately 70% of the respondents said that their organization offers risk management education while 30% doesn't. However, the quality of the education offered by the organizations varied, the questionnaire consisted.

7) The majority of the respondents at approximately 75% chose the option of "partly agree" for the following statement: "We have good and effective communication concerning risks in our projects". The option to "completely agree" with the statement was chosen by 15% of the respondents while approximately 10% chose the option of "partly disagree".

8) Approximately 70% of the respondents stated that they identify risks by experience, 20% was using analysis for risk identification and 10% chose knowledge.

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9) Approximately 40 % of the respondents stated that maintaining stock register "Yes", 60 % said "No".
10) Approximately 40 % of the respondents stated Money was perceived by the respondents as the mostly risk occurs then followed process lack of time, poor material, poor labour, natural disaster, poor equipment and safety hazards.

B. Project Management

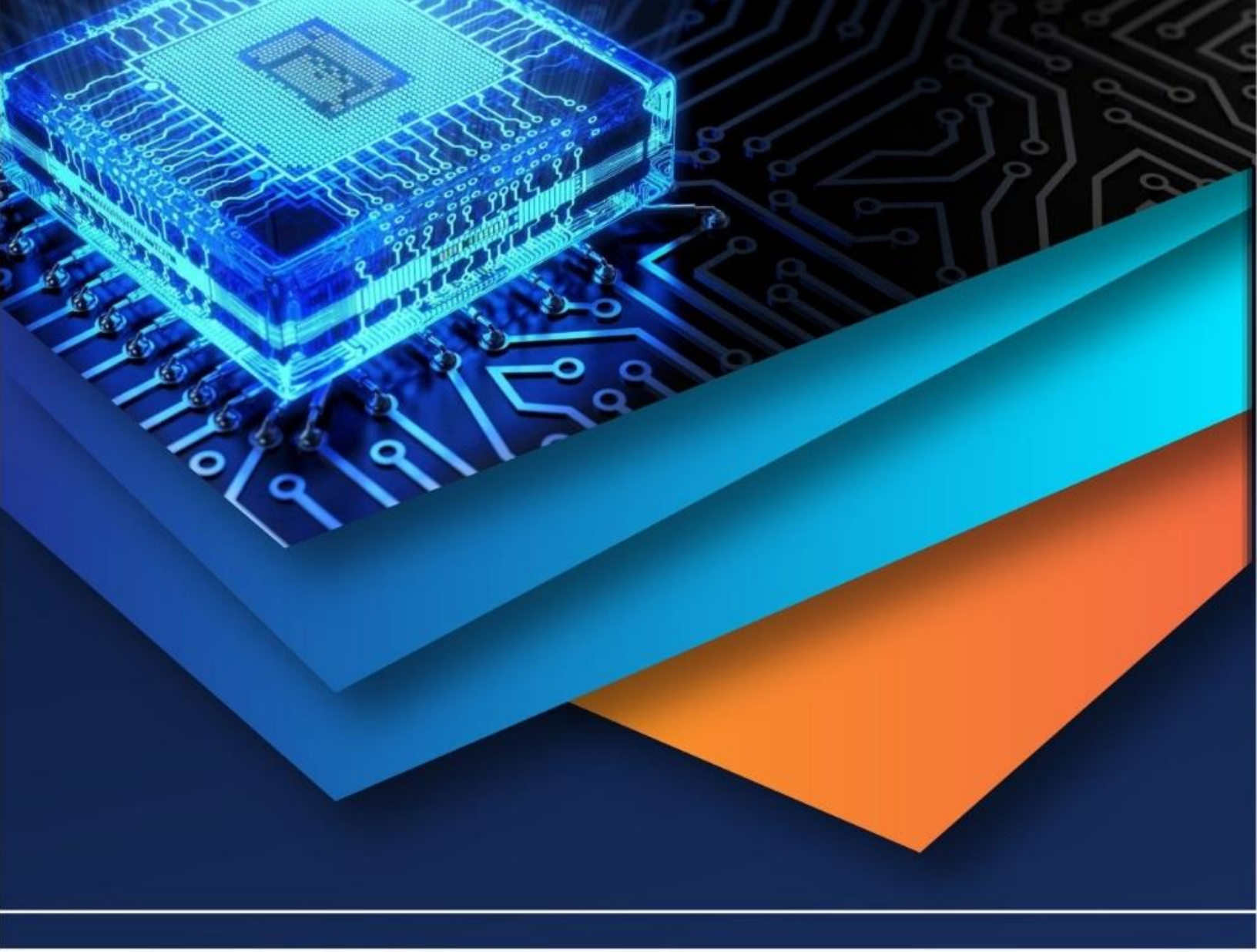
1) 70% of think that project management play very important role in Construction Industry and 30% of respondent no category.
2) 50% Percentage respondents feels that project leadership comes from staff planning Where 20% feels its term the Discipline, where only 10% believe its Team building & 20% say Coaching.
3) Out of the total respondent surveyed, there is mixed responses of respondent 60% of the respondent are member of the Construction Client Group, and 40% said no.
4) Project management is an effective and powerful strategy and should be implemented in construction Industry 80% respondents feel that the project management is the important issue with the success of the project where 20% is not.
5) From out comes 60% respondents feel Project Management is necessary for every industry and 40% of respondent said no category
6) 30% of the project expeditor form of organization be used When the project is extremely important to the organization, 50% of respondent said when a project's cost and importance are relatively low, 10% of respondent said when the project manager has a lot of responsibility and accountability, and 10% when the organization's primary source of revenue is derived from projects..
7) A large number of respondent formal reporting and reviews violate the basic principles of project management because they do not appear on the project schedule.
8) Most of the respondent said around 80% Planning and managing engineering, procurement construction services through project management
9) 60% of think that construction materials, elements, and modules are good maintained by project management and 40% of respondent said no.
10) It can be concluded that maximum number of respondent of the were think that project management for engineering, procurement and construction industry deliver good qualities materials to their customers as 70% and 30% are said no.

IV. CONCLUSION

The management of construction projects requires knowledge of modern management as well as an understanding of the design and construction process. Also know the advanced risk analysis methods, possibilities of risks arrived from the starting to ending of projects. The role of project managers is to direct & co-ordinate the processes & resources during the life of a project to achieve the project objectives.

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