Risk Assessment Of Construction Project In India

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Abstract
The main objective of this paper is to investigate the risk assessment of construction project commenced by Government, Private and Non-Governmental organization. The risk evaluation criteria are listed by taking into consideration the Delivery System, identifying process in project life cycle, planning process, analysis process, Classification process, Monitoring process, controlling process and Communication process of a construction project. Consequently the questionnaire was prepared and distributed to the related construction professionals. Subsequently the collected data was analyzed through statistical tool. The affecting factors were measured and ranked for various construction professionals. The top major ways for avoiding the risk must be on consideration. The background and presented criteria of construction project risk assessment are provided and key findings from the analysis are presented here.

Keywords: Risk analysis, Project life cycles, Statistical tool

1. Introduction
The construction industry is expanding its importance in the market, because of the increasing demand. The recovering of the construction area is very important to the engineering services sector. Due to increase in demand, we verify that it is necessary of the hour to include risk management in project planning and management.

The risk factor in construction industry is very high. Life cycle of construction objects is full of various risks. Risks come from many sources[3]. Moreover, the size and complexity of construction objects are increasing, which adds to the risks. Risk management is an operational
process comprising definition of sources of uncertainty (risk identification), estimation of the consequences of uncertain events/conditions (risk analysis), generation of response strategies in the light of expected outcomes and, finally, based on the feedback received on actual outcomes and risks, carrying out identification, analysis and response generation steps repetitively throughout the life cycle of an object to ensure that the project objectives are met[4]. Furthermore, specific buildings, projects, and firms face markedly different level of risks. The variables that have been identified to contribute to the level of risks can be categorized into the followings groups: country, industry, project, and enterprise specific risks.

2. Materials and Methods

Based on various literatures studied we framed the objectives of this study as follows,

To identify the various risk assessment factor in construction projects, like Delivery System, identifying process in project life cycle, planning process, analysis process, Classification process, Monitoring process, Controlling process, Communication process of a construction project. Questionnaires are developed on the above identified fields and distributed to the relevant peoples and are collected after a time gap.

The data’s are collected from various engineers of 64 difference construction, almost 95 questionnaires are collected from the companies. The collected data’s are compiled and sorted out based on various risk factors. The collected data have been analyzed using the software tool SPSS.

3. Result and Discussion

Descriptive analysis involves the calculation of the measures of central tendency, the mean, measures of variability, and the standard deviation. These two are useful to determine the central tendencies and dispersion of the variables selected for the study. The computed values of the mean and the standard deviation are used to describe, the properties of particular samples and descriptive statistics is used to reduce the bulk of data to manageable size.

3.1 Delivery System

Table 1 Frequency and Distribution of Delivery System on the Project.

| Delivery System | Frequency | Percent |
|-----------------|-----------|---------|
| DBB             | 21        | 22.1    |
Table 1 shows the frequency and percentage distribution of the Delivery system on the project of the respondents. It is noted from the table that 22.1 percent of the respondents DB, 34.7 percent of the respondents CM, 22.1 percent of the respondents CM, 1.1 percent of the respondents BLT, 4.2 percent of the respondents BOT, 8.4 percent of the respondents PPP, It is observed that 3.2 percent of the respondents DBOT.

3.2 Identifying Processes

Data analyzed by the SPSS tool in project life cycle show that all the factor values in project life cycle are above 0.5 percent and all the values are accepted.

Table 2 Mean and std. Deviation to identifying process in project life cycle.

| Name of Factors                  | N  | Mean  | Std. Deviation | Rank |
|----------------------------------|----|-------|----------------|------|
| 1 Top manager support            | 95 | 1.4632| 0.71176        | 7    |
| 2 Objective setting              | 95 | 1.3895| 0.51146        | 9    |
| 3 Risk assessment appetite defining | 95 | 1.7158| 0.72439        | 3    |
| 4 Defining risk assessment ownership | 95 | 1.7789| 0.74632        | 2    |
| 5 Risk communication             | 95 | 1.7368| 0.84060        | 1    |
| 6 Conducting training programs   | 95 | 1.5368| 0.71176        | 6    |
| 7 Allocation of sufficient resources | 95 | 1.5895| 0.72192        | 4    |
| 8 Corporate risk culture         | 95 | 1.7368| 0.71772        | 5    |
| 9 Establishing of means of risk assessment, | 95 | 1.3789| 0.58671        | 8    |
identification, analysis and response

Table 2 shows the nine factors were identifying process in the construction project, (1.7368, 0.84060) Risk communication is the highest level factor to project success and (1.3895, 0.51146) Objective setting.

3.3 Planning Processes

Table 3
Mean and std. Deviation to planning process in project life cycle.

| Description                                                                 | N  | Mean  | Std. Deviation | Rank |
|------------------------------------------------------------------------------|----|-------|----------------|------|
| Top manager support                                                         | 95 | 1.3895| 0.49022        | 9    |
| Objective setting                                                            | 95 | 1.5579| 0.55956        | 8    |
| Risk assessment appetite defining                                           | 95 | 1.7789| 0.71725        | 4    |
| Defining risk assessment ownership                                          | 95 | 1.6947| 0.73040        | 3    |
| Risk communication                                                           | 95 | 1.6105| 0.78949        | 2    |
| Conducting training programs                                                | 95 | 1.5263| 0.61612        | 6    |
| Allocation of sufficient resources                                          | 95 | 1.5684| 0.66289        | 5    |
| Corporate risk culture                                                       | 95 | 1.9053| 0.79992        | 1    |
| Establishing of means of risk assessment, identification, analysis and response | 95 | 1.5053| 0.58115        | 7    |

Table 3 shows the nine factors were planning process in the construction project, (1.9053, 0.79992) corporate risk is the highest level factor to project success and (1.3895, 0.49022) Top manager support is the most factor effects the construction projects.

3.4 Analysis Process

Table 4
Mean and std. Deviation to Analysis process in project life cycle.

| Description                                                                 | N  | Mean  | Std. Deviation | Rank |
|------------------------------------------------------------------------------|----|-------|----------------|------|

4
Table 4 shows the nine factors were Analysis Process in the construction project, (1.8211, 0.81187) Risk assessment appetite defining is the highest level factor to project success and (1.4737, 0.54269) Establishing of means of risk assessment, identification, analysis and response is the most factor effects the construction projects.

3.5 Classification Process

Table 5 Mean and std. Deviation to classification process in project life cycle.

| Descriptive Statistics | N  | Mean   | Std. Deviation | Rank |
|------------------------|----|--------|----------------|------|
| Top manager support    | 95 | 1.4737 | 0.69714        | 6    |
| Objective setting      | 95 | 1.5158 | 0.54310        | 8    |
| Risk assessment appetite defining | 95 | 1.8211 | 0.81187        | 1    |
| Defining risk assessment ownership | 95 | 1.6842 | 0.70353        | 4    |
| Risk communication     | 95 | 1.5895 | 0.76485        | 3    |
| Conducting training programs | 95 | 1.5158 | 0.66626        | 7    |
| Allocation of sufficient resources | 95 | 1.6000 | 0.77734        | 2    |
| Corporate risk culture | 95 | 1.7789 | 0.70226        | 5    |
| Establishing of means of risk assessment, identification, analysis and response | 95 | 1.4737 | 0.54269        | 9    |
Establishing of means of risk assessment, identification, analysis and response

Table 5 shows nine factors were Classification Process in the construction project, (1.9158, 0.78093) Defining risk assessment ownership is the highest level factor to project success and (1.6000, 0.55352) Objective setting is the most factor effects the construction projects.

3.6 Monitoring Process

Table 6 Mean and std. Deviation to Monitoring process in project life cycle.

| Descriptive Statistics | N  | Mean | Std. Deviation  |
|------------------------|----|------|----------------|
| 1 Top manager support  | 95 | 1.4000 | 0.53395       |
| 2 Objective setting    | 95 | 1.6316 | 0.77257       |
| 3 Risk assessment appetite defining | 95 | 1.7474 | 0.86256       |
| 4 Defining risk assessment ownership | 95 | 1.6105 | 0.71896       |
| 5 Risk communication   | 95 | 1.6737 | 0.79147       |
| 6 Conducting training programs | 95 | 1.6105 | 0.71896       |
| 7 Allocation of sufficient resources | 95 | 1.5368 | 0.63263       |
| 8 Corporate risk culture | 95 | 1.9474 | 0.82987       |
| 9 Establishing of means of risk assessment, identification, analysis and response | 95 | 1.5053 | 0.61668       |

Table 6 shows the nine factors were Monitoring Process in the construction project, (1.7474, 0.86256) Risk assessment appetite defining is the highest level factor to project success and (1.4000, 0.53395) Top management support is the most factor effects the construction projects.

3.7 Controlling Process

Table 7 Mean and std. Deviation to Controlling process in project life cycle.

| Descriptive Statistics |
|------------------------|

Table 7 shows the nine factors were Controlling Process in the construction project, (1.7474, 0.86256) Risk assessment appetite defining is the highest level factor to project success and (1.4000, 0.53395) Top management support is the most factor effects the construction projects.
Table 7 shows the nine factors were Controlling Process in the construction project. (1.8737, 0.90203) Risk assessment appetite defining is the highest level factor to project success and (1.4105, 0.55534) Top management support is the most factor affects the construction projects.

3.8 Communication Process

Table 8 Mean and std. Deviation to Communication process in project life cycle.

| Descriptive Statistics | N  | Mean  | Std. Deviation | Rank |
|------------------------|----|-------|----------------|------|
| 1 Top manager support  | 95 | 1.4632| 0.56135        | 9    |
| 2 Objective setting    | 95 | 1.6842| 0.70353        | 7    |
| 3 Risk assessment appetite defining | 95 | 1.9895| 0.88118        | 1    |
| 4 Defining risk assessment ownership | 95 | 1.7789| 0.80131        | 2    |
| 5 Risk communication  | 95 | 1.6316| 0.63669        | 8    |
| 6 Conducting training programs | 95 | 1.6737| 0.73575        | 5    |
| 7 Allocation of sufficient resources | 95 | 1.6316| 0.79964        | 3    |
| 8 Corporate risk culture | 95 | 1.7053| 0.78379        | 4    |
Establishing of means of risk assessment, identification, analysis and response

Table 8 shows the nine factors were Communication Process in the construction project, (1.9895, 0.88118) Risk assessment appetite defining is the highest level factor to project success and (1.4632, 0.56135) Top management support is the most factor effects the construction projects.

3.9 Project Risk Assessment Processes to Construction Project Success

Risk assessment process in construction projects, the data show that all the factors values are above 5 percent, the factors are all accepted.

| Table 9 Mean and std. Deviation to construction project success. |
|---------------------------------|------|----------------|--------|-------|
| | N  | Mean | Std. Deviation | Rank  |
| 1 | Cost | 95  | 1.6000         | 0.57242| 12    |
| 2 | Time | 95  | 1.7474         | 0.65181| 8     |
| 3 | Quality | 95 | 1.4421         | 0.54021| 13    |
| 4 | Client satisfaction | 95 | 1.6737         | 0.67544| 6     |
| 5 | Employee satisfaction | 95 | 1.6211         | 0.65524| 7     |
| 6 | Building user satisfaction | 95 | 1.7053         | 0.68220| 5     |
| 7 | Project safety | 95  | 1.4211         | 0.59392| 10    |
| 8 | Cash management | 95  | 1.7368         | 0.68743| 4     |
| 9 | Design goals | 95  | 1.6000         | 0.64247| 9     |
| 10 | Organization with benefits | 95 | 1.8211         | 0.75764| 2     |
| 11 | Country infrastructure benefits | 95 | 1.7368         | 0.58729| 11    |
| 11 | Profits earned margin | 95  | 1.8632         | 0.75245| 1     |
| 12 | Environmental standards and performance | 95 | 1.6632         | 0.69360| 3     |
Table 9 shows the thirteen factors were Risk Assessment Processes to Construction Project Success, are presented the Profits earned margin is the (1.8632, 0.75245) highest level factor to project success in south sudan and (1.4421, 0.54021) Quality is the most factor effects the construction projects.

4. Conclusions

The construction companies need to include risk assessment as the important part in projects to get success, the identification and assessment of the projects risk are the critical procedures for projects, this study present the results obtained through questionnaire survey conducted. The study determine to identify the process in pre-project phase, risk assessment appetite defining, corporate risk culture and top manager support in construction projects.

The study determine planning in pre-project phase the Allocation of sufficient resources, top manager support, Objective setting. Risk assessment appetite defining, conducting training programs and Establishing of means of risk identification in construction projects.

The study determine the risk analysis process in planning, design phase, contractor selection and site mobilization phase, risk, corporate risk culture, allocation of sufficient recourses, top manager support defining risk assessment ownership in construction projects.

The study determine the classification process in planning, designing, contractor selection and site mobilization phase, allocation of sufficient resources, top manager support, risk assessment appetite defining, contracting training programs, Establishing of means of risk identification and Objective setting in construction projects in south India is the most important factor for identifying risks assessment.

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