



Factors Considered for Contractor Evaluation and Selection in Construction Projects

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ABSTRACT

Contractor evaluation and selection is a critical decision that is undertaken by any Client and is vital to the success of any construction project. A proper evaluation process should be conducted prior to the award of contract, characterized by many factors such as: Contractor's resources and skills, experience on similar projects(track-record) and financial stability.

Selection of the right Contractor is a vital process in construction projects. This paper identifies the most important factors that influence the evaluation and selection of Contractors. A questionnaire was distributed to experts in the construction domain to determine the importance of factors that are taken into consideration by the main contractor to select the most suitable contractor. A survey was carried out which was conducted with many experts in the construction field to determine the score of each factor.

Contractor selection is one of the main activities of clients. Without a proper and accurate method for selecting the most appropriate contractor, the performance of the project will be affected. The Discriminant Function Analysis is suggested to be a viable method for contractor selection. Statistical analysis is carried out on the feedback of the respondents of the survey. By using SPSS software, the frequency of the results of the questionnaire was determined.

Keywords— Contractor evaluation, Selection, Construction project, Client

The main objectives of the contractor selection process are to reduce project risk, maximize the quality and maintain strong relationships between project parties. The same concept is applied to the contractor selection process. Some owners regard the cost as the most important criteria to base the contractor selection process. Many main contractors and owners are merely interested in the lowest bidders. But there are other criteria that should be taken into consideration, leads to the right selection of the best alternative, which has many benefits for all parties in the construction project.

The selection of construction contractors are very often conducted during tendering. The selection of a proper construction contractor increases chances of successful completion of a construction project. In a study taking into consideration the following criteria of selection: technology and equipment, management, experience and knowledge of the technical staff, financial stability, quality, being familiar with the area or being domestic, Reputation, and creativity and innovation.

The research has mainly three objectives; first, to determine the essential criteria related to the selection of a contractor; second, to examine and evaluate the extent to which these criteria are essential to a successful project delivery; and third, to set up the predictive models on the contractor selection criteria influencing target performance and overall success in projects.

I. INTRODUCTION

Construction contractors have big influences upon projects and their successes. Therefore, it is quite critical to select a qualified contractor in the process of construction management. A competent construction contractor is one of the indispensable conditions of a proper process and completion of a construction project. There are several theoretical frameworks or models applied in the evaluation of contractors. And there are some practical criteria for selecting an appropriate contractor.

II. METHODOLOGY

The methodology provided in this project is given below:

- Study of literature related to contract selection factors analysis.
- Preparation of questionnaire.
- Site visit to many construction project sites.
- Distribution of the questions to in person and e-mail.

- Collection of data from the respondents.
- Analyzing the questionnaire.
- Remedial measures are to be suggested and the present data is to be recorded for future references.
- Conclusions, recommendations and suggestions for future study.

The statistical analysis is the most powerful tool for taking appropriate decisions, and hence it is adopted in this research. The various steps involved in the project are shown in Figure 1.

In actuality, contractor evaluation is often performed by industry professionals using their accumulated experience and judgment. There are variations in the amount of effort expended in the process, often without an understanding of how such variations influence the project outcome. An important step in evaluation is to examine the contractor's system for handling project information regarding work tasks. Many factors should be considered during the contractors' qualification screening.

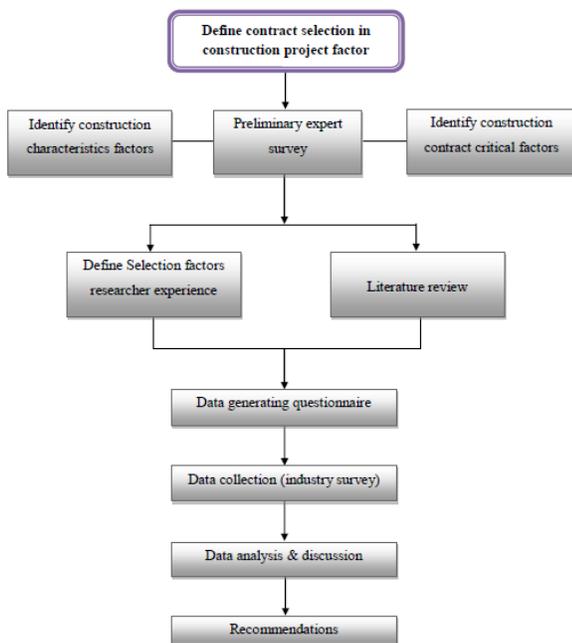


Figure 1: Methodology Flow Chart of Contract Selection in Construction Project

III. PRIOR APPROACH

The history of contractor selection process started in the early age of the construction industry, and by the end of the 18th century builders and architects had established the traditional procurement process. This era was hugely important in the evolution of the construction industry and tender process. Reference claims that in the construction industry, experienced contractor is a strong

requirement for the project's life. Thus, choosing the right contractor is one of the most key decisions in any project.

There are some factors that need to be considered when choosing a contractor such as, contractor's years of service in the construction field and in similar projects; further, contractor's average work volume in the construction field and in similar projects as well as, contractor's average work value with different types of contract; finally, geographical and weather conditions. One of the most challenging features in the construction industry sector is dealing with a huge number of firms, from small to big multinational firms. To run the business financial stability situation for the company and contractor are very important. Contractors can utilize the company with their own money, but only for a few months, to avoid the failures.

IV. OUR APPROACH

Study was done mainly by surveys, through questionnaires and structured interviewing of construction consultants and clients using statistical approaches. Statistical approaches are the Discriminant Function Analysis is suggested to be a viable method for contractor selection. Data Analysis using SPSS (statistical package for the social sciences). The responses of the questionnaires is to be analysed using factor analysis, and evaluated to determine the common factors of contractor evaluation and selection.

The questionnaire constituted three parts, which are as follows: Part A - personal details, Part B - questions related to selection factor, Part C - question related to past contractor performance.

The following list includes most of the key components that should be examined when conducting a contractor qualification : Financial standing, Technical Ability, Management capability and current projects.

The discriminant or discriminant function analysis is a parametric technique, which determines the weight of the quantitative variables or predictors, which can be used to discriminate between two or more than two groups of cases. The analysis creates a discriminant function, which is a linear combination of the weightings and scores of these variables. The maximum number of functions is the smaller value of the following (i) the number of predictors and (ii) the number of groups minus one (Ramayah et al 2010).

$$Z_jk = a + W_1X_{1k} + W_2X_{2k} + \dots + W_nX_{nk}$$

Where,

Z_jk = Discriminant Z score of the discriminant function j for object k . a = Intercept.

W_i = Discriminant coefficient of the Independent variable i

X_j = Independent variable i for object k .

In a two group discriminant function, the cutting score will be used to classify the two groups uniquely. The cutting score is the score used for constructing the classification matrix. The optimal cutting score depends on the size of the groups.

The survey is to be self administered and distributed among one hundred clients in various construction organizations in the state of Tamil Nadu, Karnataka and Kerala, India. Initially the questionnaire will be distributed to the respondents and will be collected later. At least 60% of respondents are expected to provide feedback.

In the research, few methods of data collection used includes observation, documentations, interviews, questionnaire and documentary analysis. The good design of the questionnaire is a key to obtain good results and warranting a high rate of return. The questions of the research questionnaire are constructed based on:

- Study of the literature review.
- Interviews with client and contractors to obtain different thoughts, which can be useful for creating questions.
- The experience of the researcher and some engineers in construction projects.

V. CONCLUSION

A majority of the respondents were either diploma holders or bachelor's degree holders. Only less than 10% of the respondents had a master's degree. Also single contractor are using entire project were very less in number, being only 11% among the respondents.

For contractor selection, factors were rated 2 for "yes" and 1 for "no". Seven out of twenty two factors had mean value greater than 1.90. The least mean of 1.400 was seen for the factor "whether select the contractor locally available."

For past contractor performance, values are given between 1 to 5 where 5 is very good and 1 is very poor. Five out of forty factors had a mean value above 4. The highest valued factor was "Use of experienced contractors and suppliers." The least value of 2.818 was seen for factor "Delay"

A discriminant analysis was done, to find which of the different factors discussed above are important in discriminating between those client are select contractor or not. Though all the demographic factor like —the contractor satisfaction in our project is group variable, such as its also selection faction and others were included in the model, along with the ten basic factors like (a) cost (b) quality (d) staff's behavior (e) safety (f) disputes and risk (g) time (h) experience (i) tender (j) resources and (k) others (client relationship), the findings show that the ten basic factors listed above explain most of the discrimination between the contractor selection.

Since these ten variables had a significant relationship with some of the demographic details like to find a place in the Standardized canonical discriminate function that was generated. Only the '_contractor selection', was part of the final discriminant function apart from the ten variables generated, based on the 44 questions asked. Table 1 shows the standardized Canonical Discriminant Function Coefficients.

| F.No. | Factor | Function coefficients |
|-------|----------------------------------|-----------------------|
| 1 | Cost in project | .236 |
| 2 | Quality | .467 |
| 3 | Staff's behavior and experiences | -.426 |
| 4 | Safety | .385 |
| 5 | Disputes and risks | -.163 |
| 6 | Time (delay) | .492 |
| 7 | Experiences of the company | .401 |
| 8 | Tender | -.001 |
| 9 | Resources | .141 |
| 10 | Relationship with the client | .700 |

Table 1: Standardized Canonical Discriminant Function Coefficients

Based on the study, some suggestions are provided here to improve the selection of contractor in an organization.

- a. the person is good relationship with client
- b. the contractor will be completed the project in time, without delaying
- c. the contractor as good amount experience in construction field
- d. the contractor having a good quality of material and equipment
- e. the contractor maintain the proper safety provide in work site and
- f. the project finished as between the tender cost.

To improve the contractor selection all these factors should be given equal importance. All these factors are considered, and the following suggestions are provided for recruiting the correct type of contractor will be select in the construction project.

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