

Subcontractor Selection on Financial Information for Construction Projects

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Abstract - Selection of subcontractors plays a vital role in the construction industry. The performance of the project will depend on the efficiency of contractor. Choosing a right contractor can make a project to avoid cost overrun, delay in construction, reworks, conflicts and dissatisfaction of customers which come across clients who complain about contractor's performance. They find some contractors to be not so professional, lacking required resources, missing deadlines, making inflated claims, and more. Contractors who do not have necessary qualification and resources required and expected of a good contractor, get into the system because of loopholes in the existing bid process management practices. They gain experience at the cost of client's time and money, and grow in size.

Key Words: Subcontractor Selection, Construction management, bid process management practices.

1. INTRODUCTION

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 sub-contractor selection process. Some owners regard the cost as the most important criteria to base the contractor selection process on; however, research recommends that a multi-criteria selection process should be further taken into consideration.

1.1 Subcontractor selection criteria

This research paper discusses about general procedures of contractor selection criteria and selection process which are traditional methods. The flow of trend from earlier stage selection criteria to current selection criteria. The researcher has done a research on selection criteria from 2004 to 2013 and their updating selection criteria. According to this paper most preferred selection criteria are Overall experience, similar experience, current workload and bid capacity, Financial capacity, Analytical models for contractor selection. Bid documents are not standardized, and, where standard documents are available, they are used indiscriminately for various types of the projects not addressing project-specific needs. Criteria for selection of contractors are largely based on experience of contractors and their financial capacity, which is often found inadequate.

1.2 Overview of feasibility study

The main study of this research paper is around the study of feasible studies of construction companies in Arab countries. Generally, there are no standard procedures to carry out the feasibility study, especially for public projects, in Arab countries. In addition to the limited and constrained capital resources, these countries are characterized by lack of different social, economic and environmental information. The paper gives a brief study procedures used in the public sector in different Arab countries along with their advantages, disadvantages, and items of inconsistency. A study of 91 highway public projects, in Egypt, was conducted by the authors to gain a better understanding of the Egyptian public sector as a sample study of the Arab countries. The researcher concluded the existence of inconsistency in the used feasibility study procedures. This research paper has some procedures which are used to study the financial feasibility of a company.

2. RESEARCH OBJECTIVES

To identify the financial criteria and financial factors which are considered in the pre-qualification stage of selecting a contractor and sub-contractor in the tendering process. To further identify the criteria whose presence, optimize sub-contractor performance. To further identify the missing criteria whose absence sub-optimizes sub-contractor performance.

2.1 Problems

Because of lack of knowledge on the financial criteria, there are no standard criteria in qualification process. Every company has its unique way to select subcontractors.

2.2 Methodology

Selection of contractor is a vital process in the construction industry. By selecting the perfect contractor makes a project successful. The methodology used to evaluate selection criteria or list in the selection of sub-contractor is, we have prepared a questionnaire and we will spread the questionnaire to the proper respondents who are working in the contractor firms and some of the client firms. The questions mostly cover the financial criteria of subcontractor. The financial criteria required in selecting a sub-contractor

are included in the questionnaire. Based on the results from the survey we are going to select a method to analyse the data.

2.3 Gap in Literature

Every research paper or every firm have its own definition on the financial criteria. There is no constant selection criteria on the basis of financial terms. There are many financial criteria which are followed by different countries, which are turnover, obligations, past payments, pending claims, liabilities, current ratio, credit rating, retention theory etc. The main gap in literature is that financial stability or financial criteria is not defined perfectly.

Table -1: Factor significance table

Coefficients			
Model	S	Standard Error	Beta
Past Performance	0.167	0.145	0.181
Bank Credit Credentials	-0.041	0.145	-0.044
Working Capital	0.001	0.145	0.001
Financial Ratio	-0.084	0.145	-0.091

We can see that out of all the components only Supplier Feedback (sig. 0.005) have significance less than 0.05 and Operating Profit (sig. 0.077) has significance near to 0.05. Hence we can say that out of 9 components (i.e. reduced independent variable) obtained from factor analysis, Supplier Feed Back has the most influence on the dependent variable (i.e. satisfied or not satisfied after the sub-contractor is hired). Now with the help of coefficient table (i.e. table 6) we can numerically define the relationship between the dependent variable (i.e. satisfied or not satisfied after the sub-contractor is hired) and independent variables (i.e. component1 to component9), the relation is mentioned below,

$$Y = K + x_1\beta_1 + x_2\beta_2 + x_3\beta_3 + x_4\beta_4 + x_5\beta_5 + x_6\beta_6 + x_7\beta_7 + x_8\beta_8 + x_9\beta_9 + \epsilon_i$$

From table we get the above values as,

Y = Satisfied or Not after the sub-contractor is hired

K = Constant/ Intercept = 2.00

β_i = Regression Coefficient (i.e. for each Component from component1 to component9)

3. RESULT

The following factors, treated as independent variables, are analyzed using Linear Regression Analysis against the dependent variable (i.e. 'Satisfied or not satisfied after the

sub-contractor is hired'), based out of the scaled data points obtained from the questionnaire:

1. Supplier Feedback
2. Past Performance
3. Bank Credit Credential
4. Claim History
5. Operating Profit
6. Working Capital
7. PAT
8. Financial Ratio
9. Asset Value of Firm

From the above it can be seen clearly that only Supplier feedback holds significance for predicting the dependent variable i.e. satisfied or not satisfied after the sub-contractor is hired, as it has significance lower than 0.05. Also, a correlation co-efficient of 0.605 indicates higher degree of correlation between the factors and the dependent variable while an R-squared value (Co-efficient of determination) of .365 indicates that 36.5 % of the variations in data points of the dependent variable are explained by the independent factors. From regression analysis it can be said that out of so many data being collected on sub- contractor by the contractor or client, all the factors are not considered while selecting the sub-contractor, i.e. only supplier feedback is the factor which has significant influence on the dependent variable (i.e. Satisfied or Not after the sub-contractor is hired).

Thus, in conclusion we can say that the variables selected by us for determining the satisfaction level after the sub-contractor is selected can be reduced to nine independent variables as obtained from factor analysis (i.e. component1 to component9). Out of this 9 independent variable we can conclude that Supplier feedback has the most significant impact on determining the satisfaction level of client or contractor after the sub-contractor is hired.

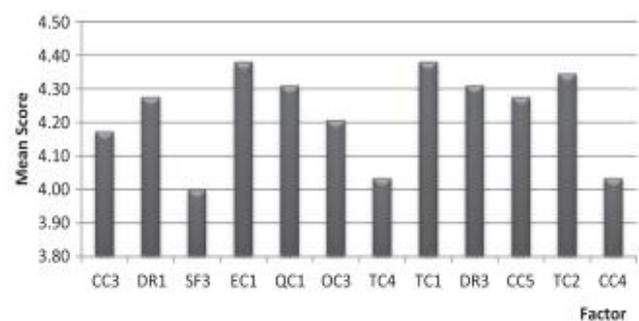


Fig. 1 Mean score of important factors.

Therefore, the extent to which sub-contractors handle delays falls under the same umbrella; which was proven in this study. Moreover, as highlighted by many of the previous studies, the tender price should not be the main criterion based on which the selection process occurs. However, in real life it is still an important factor in the sub-contractor's selection process. This was highly supported in this study; as the tender price factor is among the 12 most important factors, yet it came in the sixth level out of the eight levels of their ranking. Furthermore, surprisingly cost overruns factor is not one of the 12 top factors; its mean score came out to be 3.86. This shows that price and cost are not regarded by main contractors as the best indicators of the most adequate sub-contractor in their decision making process. From the frequency table, it is concluded that the Quality factor and delay factor are the most important factors because 89.66% of the respondents gave them the scores 4 and 5.

4. CONCLUSIONS

The main objectives of the sub-contractor selection process are to reduce project risk, maximize the quality and maintain strong relationships between project parties. Earlier, the criteria used by clients and main-contractors to hire sub-contractors was the lowest bid and minimum time, hiring based on these two criteria has led to time over run and cost overrun, which in turn leads to lower satisfaction of clients and main-contractor after the sub-contractor is selected. Thus, we decided to look for other parameters that can be used for hiring the sub-contractor. Based on extensive literature review we found 21 different financial parameters.

Study of the responses obtained from questionnaire reveals that almost all the respondents most often take into consideration the financial criteria, which is evident from table 1.0, where for 16 criteria the mean of the responses is between often to sometime, while for 4 criteria the mean response is between always and often, and for 2 criteria the mean response is between sometime to never.

After carrying out Factor Analysis and Regression Analysis to determine which among these 21 parameters dominates the satisfaction level, we found that supplier feedback is the most influential factor, which affects the satisfaction of clients and main-contractor. This shows that inspite of collecting lot of data on financial, credit aspects from sub-contractors, the only data which is actually used to access sub-contractor satisfaction is supplier feedback. This indicates that while contractor during the bidding process are creating enormous amount of paper work by collecting data, relevant data analysis is not being performed for decision making.

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