

A Comparative Study on Contractors' Performance in Government and Private Sector Projects

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Abstract - The construction industry is a significant part of every economy and that performance assessment holds the key to its success of national socio-economic goals. Construction projects and their success are closely related to contractors. The selection of a suitable construction contractor increases chances of successful completion of a construction project. Contractors' performance can provide robust benchmarks for contractors and help to identify ways towards performance improvement. Contractor performance can be defined by the level and quality of projects delivered to clients. The study is to provide a method for evaluating the performance of contractors in government and private construction projects. Questionnaires were designed depending upon the various factors which affect the contractors' performance in both government and private sector projects. The questionnaires are distributed to various construction companies. The analysis is done for responses from contractors, engineers and owners in government and private sector projects using SPSS. To improve their overall performance, contractors are advised to focus on construction time and cost, safety and health of labors, reduce delays, maintain a stable workforce and establish partnerships with their subcontractors.

Key words: Contractor Performance, Performance Assessment, Frequency, Cronbach's alpha, Reliability, Multiple Regressions.

I. INTRODUCTION

A general contractor is in charge for the day-to-day supervision of a construction site, management of vendors and contact of information to involved parties throughout the development of a building project. A construction contract is a mutual requisite agreement between two parties based on policies and conditions recorded in document form. The parties involved are one or more owners and contractors. The owner has full power to decide the type of contract to be used for a specific development to be constructed and to set forth the legally-binding terms and conditions in a contractual agreement. A general contractor is responsible for the overall coordination of a project. A contractor is accredited to a construction project once the design has been completed by the person or is still in development. This is done by going through a bidding process with different contractors. The contractor is selected by one of three common methods:

- Low-bid selection
- Best-value selection
- Qualifications-based selection

1.1. Objectives of study

- To list out the performance parameters which are critical for the success of contractors.
- To analyze and compare the performance of contractors in government and private sector projects.

1.2. Need for study

The selection of good construction contractors are very often conducted during tendering. Tendering indeed gives a client a choice in granting contract a company which proposes the lowest price and short construction cycles. Poor performance of contractor results in poor quality of the products and time delay in construction resulting in cost and time over run. This can be avoided by proper choice of contractors when past performance data is available. Performance evaluation of contractors provides a base for selection of contractors based on the importance of work and capability of contractor. Comparison provides base for improvements in performance of contractors.

1.3. Scope of study

Scope of the study is limited to views of contractors, owners and engineers related to performance in government and private sector projects in Tamil Nadu. Questionnaires were framed and distributed to various engineers, contractors and owners in Tamil Nadu.

1.4. Methodology

- Literature Review
- Identification of Factors
- Data Collection
- Questionnaire preparation
- Questionnaire survey
- Data analysis
- Results and Discussions

II. FACTOR IDENTIFICATION

The literatures collected from various journals were reviewed and the factors involved in the study were identified. The performance evaluation factors are used to evaluate the performance of contractors. Based on the factors involved questionnaire is framed to analyze the contractors' performance.

The literatures were studied and the factors which have effect on the performance of contractors were identified and listed below.

1. Quality of work
2. Timeliness of performance
3. Project satisfaction
4. Safety and health compliance
5. Budget management
6. Project management
7. Technical knowledge
8. Stress in work
9. Tender problems

2.1. Questionnaire Design

One way to collect the data necessary to analyze contractor performance is to conduct questionnaires. Questionnaires are designed depending upon the various factors which affect the contractors' performance in private and government sector projects. The questionnaire consists of two parts; first part contains the company and respondent profile and second part consists of set of questions based on the factors. The questionnaires are distributed to various construction companies. Among 105, 84 responses are received and analyzed using SPSS software. The results are discussed for further improvement. The questionnaires are designed with 5 rating systems.

III. DATA ANALYSIS FOR PRIVATE PROJECTS

3.1. Reliability Analysis

Reliability tests were carried out to find the reliability of the scale used for analysis. Prior to data analysis, the reliability of data was assessed using Cronbach’s Coefficient Alpha Method, which is commonly used as an estimate of the reliability of data. Reliability scores obtained from responses indicate adequate internal consistency.

Table 1. Reliability statistics

Cronbach's Alpha	No. of Items
0.811	30

Cronbach’s alpha value is 0.811. The value must be in the range of 0.6 to 1.0 if the data has to be reliable. Hence the data’s values are reliable.

3.2. Frequency Analysis

Frequency analysis is done for all factors and the main factors which affect the performance of contractors in private sector projects are given below.

- Project satisfied with performance of workmanship
- Proper training programs conducted for workers
- Labors subjected to stresses in various complex activities
- Workers ability to concentrate on performing their work

IV. DATA ANALYSIS FOR GOVERNMENT PROJECTS

4.1. Reliability Analysis

Coefficient Alpha Method is commonly used as an estimate of the reliability of data.

Table 2. Reliability statistics

Cronbach's Alpha	No. of Items
0.752	30

Cronbach’s alpha value is 0.752. The value must be in the range of 0.6 to 1.0 if the data has to be reliable. Hence the data’s values are reliable.

4.2. Frequency Analysis

Frequency analysis is done for all factors and the main factors which affect the performance of contractors in government sector projects are given below.

- Quality in workmanship
- Timely performance of the tasks
- Efforts made to overcome deviations and deficiencies
- Timely supply of materials and manpower

V. RESULTS

Table 3. Ranking of parameters for private projects

Parameters	Mean	Rank
Project conformed to contract requirements	1.88	21
Good quality of materials supplied at required time	2.15	19
Project works in compliance with drawings and specifications	2.09	20
Quality in workmanship	2.45	15
Timely performance of the tasks	2.33	17
Timely completion of project with sophisticated schedule	2.58	12

Timely supply of materials and manpower	2.61	11
Delays in schedule tackled in an efficient manner	2.73	8
Project satisfied with performance of workmanship	2.82	5
Efforts made to overcome deviations and deficiencies	2.55	13
Frequent inspections carried out in site	2.76	7
Project satisfied with cost, time and quality	2.30	18
Safety and health policies forms a part of company core values	2.73	8
Equipments in good operating condition	2.36	16
Safety precautions are provided for workers	2.91	4
Proper training programs conducted for workers	3.00	2
Adherence to target costs on the contract level	2.73	8
Cost overrun and change proposals priced reasonably	2.79	6
Project funds received in time	2.52	14
Subcontractors, sub consultants, suppliers and labor force well managed	2.55	13
Experienced managers and technical personnel available to resolve problems	2.76	7
Communication lines are established effectively	2.79	6
Personnel assigned to the project are well versed and experienced for the work	2.55	13
Overall technical capability of the personnel is good	2.91	4
Labors subjected to stresses in various complex activities	2.82	5
Workers ability to concentrate on performing their work	3.18	1
Productivity problems due to stress	2.55	13
Overcome issues in the approval of tender	2.64	10
Tender got approved in a shorter period without delay	2.67	9
Tendering procedures followed as per by law	2.73	8
Issues in quoting rates for the project solved smoothly	2.94	3

Table 4. Ranking of parameters for government projects

Parameters	Mean	Rank
Project conformed to contract requirements	1.81	25
Good quality of materials supplied at required time	3.33	7
Project works in compliance with drawings and specifications	2.57	20
Quality in workmanship	4.05	1
Timely performance of the tasks	3.81	2
Timely completion of project with sophisticated schedule	2.43	23
Timely supply of materials and manpower	3.57	5
Delays in schedule tackled in an efficient manner	3.21	10
Project satisfied with performance of workmanship	3.21	10
Efforts made to overcome deviations and deficiencies	3.60	4
Frequent inspections carried out in site	2.60	19
Project satisfied with cost, time and quality	3.31	8
Safety and health policies forms a part of company core values	3.02	14
Equipments in good operating condition	2.60	19
Safety precautions are provided for workers	3.17	12
Proper training programs conducted for workers	3.19	11
Adherence to target costs on the contract level	3.29	9
Cost overrun and change proposals priced reasonably	3.21	10
Project funds received in time	3.40	6
Subcontractors, sub consultants, suppliers and labor force well managed	2.19	24
Experienced managers and technical personnel available to resolve problems	2.52	22
Communication lines are established effectively	3.10	13
Personnel assigned to the project are well versed and experienced for the work	2.62	18
Overall technical capability of the personnel is good	3.00	15
Labors subjected to stresses in various complex activities	3.62	3
Workers ability to concentrate on performing their work	3.33	7
Productivity problems due to stress	3.10	13
Overcome issues in the approval of tender	2.67	17

Tender got approved in a shorter period without delay	3.62	3
Tendering procedures followed as per by law	2.88	16
Issues in quoting rates for the project solved smoothly	2.55	21

VI. DISCUSSIONS

From the analysis in private projects, the projects were not satisfied with the performance of workmanship. The percentage obtained from frequency analysis for performance of workmanship is 30.3% and it shows performance was not satisfactory. The percentage obtained from frequency analysis for efforts made to overcome deviations and deficiencies is 39.4% and it needs to be improved further for better performance. The percentage obtained from frequency analysis for frequent inspections in site is 27.3% and it needs to be improved. Inspection is must for good performance. The percentage obtained for implementation of safety and health policies is 33.3% and it has to be made strict in all construction firms. Workers safety is not considered in many firms.

Labors subjected to stresses are the most critical factor which has a high percentage of 51.5%. It shows the contractors' inability to provide suitable environment for workers to work and also not providing motivation to workers. It results in poor performance. Labors should be encouraged to reduce the stress of workers. The percentage obtained for workers ability to concentrate on work is 39.4% and it shows the deviations of workers from work. Proper steps should be taken to guide workers in difficult situation. In government projects the critical factors are quality in workmanship, timely performance of the tasks, efforts made to overcome deviations and deficiencies, timely supply of materials and manpower. The percentage obtained from frequency analysis for quality in workmanship is 38.1% and it shows performance was not satisfactory. The percentage obtained from frequency analysis for timely performance of tasks is 54.8%. The percentage obtained from frequency analysis for timely supply of materials and manpower is 39.5% and it shows the delay in supply.

Table 5. Comparative study on impact of factors on contractors' performance in government and private projects

Factors	Private β	Government β	Pooled data β
Quality Performance	0.093	0.173	0.221
Contract Issues	0.207	0.150	0.197
Labor Issues	0.221	0.099	0.181
Training for workers	0.248	0.263	0.192
Cost Issues	0.007	0.183	0.136
Technical Issues	0.175	0.244	0.206
Resource Availability	0.174	0.226	0.213
Timely Completion	0.262	0.178	0.236
Personnel Capability	0.223	0.234	0.193
Communication Issues	0.175	0.344	0.227
Safety to Workers	0.199	0.198	0.185
Tender Issues	0.121	0.230	0.145
R Square	0.961	0.898	0.933
Adjusted R Square	0.944	0.856	0.922
F Value	59.082	21.274	82.636
Significance	0.000	0.000	0.000

On comparison performance of contractors are good in some parameters for private and government sector projects. The factors which affect the performance of contractors differ for government and private sector projects. In both government and private projects, labors are subjected to stresses in various complex activities.

Multiple Regressions has been used for comparison of factors which affect the contractors' performance in government and private sector projects. Regression Coefficient (β) is used to compare the results. The results of regression analysis for the comparison of contractors' performance in government and private projects are presented in Table 5. The results for contractor performance indicated that R square is equal to 0.933. This reveals that 93.3 percent of variance in contractors' performance is affected by practice dimensions; F statistics is 82.636 which are significant at the 1 per cent level. The results show that most of the factors has a negative impact on performance. The result revealed that there is significant impact on communication issues ($\beta = 0.227$, $t = 6.614$, $P \leq 0.01$) followed by quality performance ($\beta = 0.221$, $t = 6.174$, $P \leq 0.01$).

VII. CONCLUSION

The performance of contractors has been analyzed in private and government sector projects by considering the various factors which are involved in construction activities. The parameters involved such as quality, time, budget, safety and health, tender problems, issues in quoting rates, project management, technical knowledge of personnel, stress faced by workers, productivity problems, project satisfaction. Based on the parameters, the performance was analyzed by conducting questionnaire survey. The performance of contractors has been analyzed using SPSS software.

The survey results shows that some of the parameters such as quality of work, timeliness of performance, project management, budget management, technical knowledge of personnel assigned and project satisfaction are good for private projects. In government projects timely supply of materials and manpower, quality in workmanship, timely performance of tasks, efforts made to overcome deviations and deficiencies are not good. Comparison of contractors' performance in government and private sector projects has been done using SPSS. Multiple Regressions has been used to compare the results obtained after analysis. The obtained results can be used for further improvements in performance of contractors.

In order to improve the contractor performance, contractor should focus on

- Timely completion of project
- Budget adherence to target cost
- Better project management
- Good communication and coordination
- Stress free work environment
- Increased productivity
- Implementation of safety and health policies
- Management of tender problems
- Cash flow throughout the project
- Effective budget management
- Timely supply of resources
- Timely performance of tasks

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