

## **A REVIEW ON FACTORS AFFECTING CONTRACTOR PERFORMANCE IN CONSTRUCTION WORK**

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*Abstract: The construction industry often acts as a catalyst to stimulate the growth of a nation's economy. The industry is often referred to as an engine of growth. However, numerous government reports have criticized the industry's poor performance, especially in terms of productivity, quality and quality systems. In order to improve performance, many construction companies implement the ISO 9000 series, an integrated system to ensure consistency and better performance of construction projects. The preliminary data for this research was collected through a literature review and the use of a questionnaire survey targeted at some contractors, clients and consultants in some projects in India. Few experts were interviewed and their opinions were taken to identify factors which affect contractor performance in construction projects. As the outcome, total 91 factors that affect contractor performance may be encountered in a construction project were identified. The factors for contractor performance are then classified into twelve broad categories (Cost, Time, Quality, Management, Material, Worker, Health and Safety, Client Satisfaction, Environmental, Execution, Design and Documentation, Productivity) depending on their nature and mode of occurrence. An approach is suggested to carry out ranking of these contractor performance factors by Relative importance index technique. It is hoped that the findings of the paper will help the stakeholders to act on critical contractor performance factor and further try to improve performance of their projects.*

*Keywords: Contractor performance, Relative importance index, KPI, Contractor's Performance Index*

### **INTRODUCTION**

This research aims to appraise the find out the index for contractor's performance in construction project. A conceptual research framework was generally developed to perform a study of the project management performance from the contractor viewpoint. The contractors are involved in this study to validate the research approach. It provides key performance index which can evaluate and measure potential contractors for determine their ability. Finding of the study can help construction firms to learn from the best practices of other and carry out continuous improvement. The objectives of this study are; to identify the current contractor's performance in construction project, to evaluate the performance of construction project in term of project duration, project quality and project cost, to investigate perception of client, consultant and contractor on contractor's performance index.

**This research will be carried out with the help of several journal articles and books by major contract and project management authors. This research is aimed at exploring the different types of contractor performance in construction industry. First identify the major factors that can be highly impact on the contractor performance in construction industry. After the selecting the major factor questionnaire form can be generated with the help of discussion and interview with respondents and circulate and analyzing questionnaire form. Based upon analyse data will be useful for giving the ranking of more crucial contractor performance factors. After ranking the factors generating contractor's performance index. Finding of the study can help construction firms to learn from the best practices and for giving next project to the contractor based upon their decided indices. Main objective of this study is to identify the current contractor's performance criteria in construction project based upon the various literatures.**

## **LITERATURE REVIEW**

A number of studies have been carried out to determine the various contractor performance factors in construction projects. Alwi S. et al.,<sup>[3]</sup> suggest that repair on finishing works, delays to schedule and waiting for materials were identified as the key variables, whereas design changes, lack of labours' skill and slowness in making decisions were identified as the key waste causing variables of non-value-adding activities. In this literature collected data was analysed using an Importance Index. M. R. Lee et al.,<sup>[13]</sup> identified various contractors key performance indicators and evaluate the performance in term of project duration, project quality and project cost, to investigate perception of client, consultant and contractor on contractor's KPI and finally to develop a framework for contractor's performance index for housing construction project. Hany Abd Elshakour M. et al.,<sup>[8]</sup> studied that statistical analysis of the collected responses regarding the degree of importance of the 47 performance indicators is provided using 10 most significant KPIs which include profitability, quality of service and work, growth, financial stability, cash flow, external customer satisfaction, safety, business efficiency, market share, and effectiveness of planning. Energy use, main water use, and impact on biodiversity are the lowest ranked indicators for measuring performance of construction companies. Hendrik J. Marx<sup>[9]</sup> conclude that Contractors made a loss on 4% of all projects completed. Mechanical work (51%) and special work projects (52%) showed the highest percentage of projects with contractor profit of > 10%. The higher financially graded (7 - 9) contractors were less satisfied with the performance of their employers and agents. Contractors were satisfied (=80%) with the procurement / adjudication procedures followed, but the quality of the documentation / specifications received a slightly lower score. Only 42% of all contractors were paid on time, within 30 days, with the national and provincial departments being the worst performers. Contractors gave materials delivery for building projects the lowest score. Higher financially graded contractors (7 - 9) were less satisfied with the delivery capabilities of their materials suppliers. Only 42% of all contractors were paid on time.

## **FACTORS AFFECTING CONTRACTOR PERFORMANCE**

As the outcome, total 91 factors that affect contractor performance may be encountered in a construction project were identified. The factors for contractor performance

are then classified into twelve broad categories (Cost, Time, Quality, Management, Material, Worker, Health and Safety, Client Satisfaction, Environmental, Execution, Design and Documentation, Productivity) depending on their nature and mode of occurrence. The groups of factors affecting contractor performance are shown in following charts. List of 91 contractor performance factors in construction work are given as below.

## **1. Cost:**

Cost is defined as the degree to which the general conditions promote the completion of a project within the estimated budget. Cost related factors are listed below:

- Cash flow of project
- Profit rate of project
- Material and equipment cost
- Project labour cost
- Project overtime cost
- Reward/Compensation cost
- Cost of rework
- Cost of variation orders
- Waste rate of materials
- Escalation of material prices

## **2. Time:**

It is very important for construction projects to be completed on time, as the clients, users, stakeholders and the general public usually looks at project success from the macro view where their first criterion for project success appeared to be the completion time. Time related factors are listed below:

- Time Submission of Working Drawing
- Timely in Obtaining Permits, Conducting Inspections, etc.
- Site preparation time
- Planned time for construction
- Percentage of orders delivered late
- Time needed to implement variation orders
- Time needed to rectify defects
- Average delay in claim approval
- Average delay in regular payments
- Unavailability of resources

## **3. Quality:**

In the construction industry, quality is defined as the totality of features required by a product or services to satisfy a given need, or fitness for purpose. In other words, the emphasis of quality in construction industry is on the ability to conform to established requirements. Requirements are the established characteristics of a product, process or service as specified in the contractual agreement and a characteristic is any specification or property that defines the nature of those products, processes or services, which are determined initially by the client. Quality related factors are listed below:

- Implementation of the QA/QC Plan
- Adequacy of the QA/QC Plan And Testing
- Conformance to plan and specification
- Unavailability of competent staff
- Quality of equipment and raw materials

#### **4. Management:**

Management play very crucial role in contractor performance. Poor planning and scheduling can resulting poor contractor performance. Suppose, some design related problem occurs than fast decision can take by top management improve contractor performance in construction work. Poor coordination among project participants leads poor contractor performance. A well management of resources by contractor will impact on their performance. Management related factors are listed below:

- Poor planning and scheduling
- Poor provision of information to project participants
- Poor coordination among project participants
- Slow in making decisions
- Coordination with Other Primes
- Coordination and Control of Subcontractors
- Professional Conduct
- Management of Personnel/Resources
- Provides Adequate Amount of Workforce, Materials and Equipment to Meet Schedule
- Job-Site Supervision
- Adequacy of Daily Work Log
- Review/Resolution of Subcontractor's Issues
- Practices Claim Avoidance and Minimization
- Compliance with Laws, Regulations, Permits, Inspections, Testing

#### **5. Material:**

Poor quality of material can not meet construction specification so poor quality of material give poor performance. Poor material handling can also leads poor contractor performance. Poor storage on construction site and inappropriate inventory mangement can not meet the specification. Waste of raw material should be minimum than it's make positive impact on contractor performance. Material related factors are listed below:

- Poor quality of materials
- Delay of material delivery to site
- Poor material handling on site
- Poorly scheduled delivery of material to site
- Inappropriate/misuse of material
- Poor storage of material
- Waste of raw materials on site
- Material does not meet specification
- Loss of materials on site

- Too much material inventory on site
- Unnecessary material handling
- Damaged materials on site

#### **6. Worker/People:**

People are the most important resource in completing construction projects. The category of “people” relates to the skill of the tradesmen/labourer, its distribution on site, the effectiveness of supervisors/inspectors on site. The performance of field labour is critical to the success of any construction project. People related factors are listed below:

- Site condition problems
- Employee attitudes
- Recruitment and competence development
- Employees motivation
- Belonging to work
- Lack of trades' skill
- Poor distribution of labour
- Too few supervisors/foremen

#### **7. Health and Safety:**

Health and safety are defined as the degrees to which the general conditions promote the completion of a project without major accidents or injuries. The measurement of safety is mainly focused on the construction period as most accidents occur during this stage. Throughout the world, construction industry is known as one of the most hazardous activities. Health and Safety related factors are listed below:

- Adequacy of Safety Plan
- Compliance with Worker Exposure Requirements
- Compliance with Drug/Alcohol Abuse Requirements
- Adequacy of Regulatory Compliance Documentation
- Application of health and safety factors in organization
- Project location is safe to reach
- Reportable accidents rate in project
- Assurance rate of project

#### **8. Client's satisfaction:**

Satisfaction is regarded as a function of comparison between an individual's perception of an outcome and its expectation for that outcome. In the construction industry, client's satisfaction has remained an elusive and challenging issue for some considerable time. Dissatisfaction is widely experienced by clients of the construction sector and may be caused by many aspects but is largely attributable to overrunning project costs, delayed completion, inferior quality and incompetent service providers including contractors and consultants. Client's satisfaction related factors are listed below:

- Extreme customer satisfaction
- Value of money
- Information coordination between owner and project parties

- Leadership skills for project manager
- Speed and reliability of service to owner
- Number of disputes between owner and project parties
- Number of rework incidents

## **9. Environment:**

Climate condition is important for contractor performance. Suppose, contractor can work in monsoon season than the efficiency of the work is less. In hilly region site condition is affecting the contractor performance. Environment related factors are listed below:

- Site condition
- Wastes around the site
- Climate condition

## **10. Execution:**

At execution time too much overtime for labour leads towards poor quality of work so, it will directly affect contractor performance. Proper construction method use on site so, it improves contractor performance. At execution time construction equipment shortage can impact on performance of contractor. Execution related factors are listed below:

- Too much overtime for labour
- Inappropriate construction methods
- Equipment shortage
- Poor equipment choice/ineffective equipment
- Outdated equipment
- Poor site layout

## **11. Design and Documentation:**

Unclear specification, poor quality of site documentation, unclear site drawing are various factors that will leads to poor contractor performance. Design and Documentation related factors are listed below:

- Poor quality site documentation
- Unclear specifications
- Unclear site drawings supplied
- Slow drawing revision and distribution
- Design changes
- Poor Design

## **12. Productivity:**

Numbers of project are more than less concentration of contractor over specified one project so that will be effect on contractor performance. Project complexity is high so it will require more experience people so overall cost will increase. That will directly effect on contractor performance. Productivity related factors are listed below:

- No. of Project/Year
- Project complexity

## SUMMARY

Present study outlines the major factors affecting to contractor's performance in construction projects in Indian context. Based on literature study and from interview of experts, 91 factors were identified under 12 major groups. Further methodology is suggested to work out critical factors from available various technique to identify most crucial factor which affect to the contractor's performance.

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