Study of Factors Affecting Quality of Construction Project

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Abstract— The construction industry plays a vital role in the economy. The construction industry is complex in its nature because it comprises large numbers of parties as owners (clients), contractors, consultants, stakeholders, and regulators. Despite this complexity, the industry plays a major role in the development and achievement of society’s goals. The need for achieving quality of the finished product in the building constructions is very important. Quality is an essential element for sustainability and customer satisfaction. Quality in its simplest form can be defined as ‘meeting the customer expectations’, or ‘compliance with customer specification’. No matter what definition we follow for quality, it becomes very complex when we try to put it into actual practice. This study is intended to provide clients, project managers, designers, and contractors with necessary information needed to better manage the quality of a construction building projects by identifying the factors that affect process quality of construction projects and to rank them by degree of importance.

Keywords: Quality, Quality Assurance, Customer Satisfaction

I. INTRODUCTION

Construction industry plays a major role in development and achievement the goals of society; it’s considered as one of the largest industries. Generally, construction works are increasing rapidly to meet the growing needs of the population and to keep up with global development. To progress in terms of construction, project construction must be studied carefully and prepared well in order to get the best results, and to help in moving in the right direction to establish the future goals. According to Collins (1996) Quality of projects in its simplest form can be defined as: ‘meeting the customer’s expectations ‘or ‘compliance with customer’s specification’. For a user, quality is nothing but satisfaction with the appearance, performances, and reliability of the project for given price range. The construction quality is based on the organization’s characteristics, procedure of working, and contractor follows the drawings and specifications under defined budgets, skill of labor, quality of materials and applied equipment. The importance of client/customer satisfaction has been investigated by many researchers in construction industry. Therefore, client satisfaction is a fundamental issue for construction participant who must constantly seek to improve their performance if they are to survive in the presence of the concept of globalization of construction services. Customer demands are rapidly changing as a response to changing organizational and market imperatives. The purpose of study is to examine factors affecting quality of building construction projects in India. It is very necessary to know which factors are important for quality of construction and how much the quality is impacted by factors. This study is more helpful for creating quality awareness to Construction companies.

II. OBJECTIVES

The aims and objectives of this research project are to:
1) To identify and evaluate various factors affecting the quality of construction projects.
2) To analyze the factors and ranking the factors according to relative importance.
3) To give suggestions and recommendations to improve the performance of the industry.

III. METHODOLOGY

The methodology adopted in this study is the collection of data by the method of survey. This paper aims to identify the key factors that have a significant effect on client satisfaction level and other causes that are necessary to overcome the issues. After literature study, the company has to be identified. Then the questionnaires have to be prepared and given to contractors and project consultants.
IV. Analysis

Questionnaire was designed based on factors. The survey was conducted and the results were analyzed. Weightage is given to each factor by a respondent which is as below:

1=Low Impact
2=Some Impact
3=High Impact

The relative importance index method (RII) was used to determine respondent’s perception of the relative importance of the identified quality factors. Using this formula, the major factors that affecting the quality was identified. The RII was computed as,

\[ RII = \frac{\sum w_i}{AN} \]

Where,
RII - Relative Importance Index,
W = Weightage given to each factor by the respondents (ranging from 1 to 3)
A = highest weight (i.e. 3)
N = total number of respondents.

V. Result

All the questionnaire survey was done from project manager or project engineer, site engineer, contractor of the project at the construction site. The factors which affecting the quality are Design, Communication, Conformance to codes and standards, selection of designer, Interaction among participants, Management factors, Selection of contractor, Top management support, Work execution, Material, Project size and complexity, equipment, financial issues, quality and safety systems, contract documents. Out of 62 questionnaires distributed 33 were returned. Perception of professionals in the construction industry was investigated. The table that contain the ranking of Factors is given:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Factor</th>
<th>No. Of Responses (N)</th>
<th>RII</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Conformance to Codes &amp; Standards</td>
<td>19</td>
<td>0.912281</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Design</td>
<td>33</td>
<td>0.878788</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>Material</td>
<td>33</td>
<td>0.959596</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>Financial Issues</td>
<td>33</td>
<td>0.888889</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>Top Management Support</td>
<td>33</td>
<td>0.858586</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>Interaction among Project Participant</td>
<td>33</td>
<td>0.888889</td>
<td>3</td>
</tr>
<tr>
<td>7</td>
<td>On Site Supervision</td>
<td>33</td>
<td>0.858586</td>
<td>5</td>
</tr>
<tr>
<td>8</td>
<td>Equipment</td>
<td>29</td>
<td>0.850575</td>
<td>6</td>
</tr>
<tr>
<td>9</td>
<td>Work Execution</td>
<td>29</td>
<td>0.839081</td>
<td>7</td>
</tr>
<tr>
<td>10</td>
<td>Selection of Designer</td>
<td>33</td>
<td>0.757576</td>
<td>8</td>
</tr>
<tr>
<td>11</td>
<td>Selection of Contractor</td>
<td>19</td>
<td>0.712980</td>
<td>9</td>
</tr>
<tr>
<td>12</td>
<td>Project Size &amp; Complexity</td>
<td>19</td>
<td>0.526316</td>
<td>12</td>
</tr>
<tr>
<td>13</td>
<td>Management Factors</td>
<td>19</td>
<td>0.666667</td>
<td>11</td>
</tr>
<tr>
<td>14</td>
<td>Communication</td>
<td>19</td>
<td>0.701754</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>Contract Documents</td>
<td>19</td>
<td>0.438596</td>
<td>13</td>
</tr>
</tbody>
</table>

Table illustrates the top significant factors affecting the quality of construction projects. The most important factors according to respondents are in sequence: Material, Conformance to codes and standards, Financial issues, Interaction among participants, Design and low important factors are: Contract documents, Project size and complexity, Management factors etc.

VI. Conclusion and Recommendations

A questionnaire based survey was used to find out the attitude of contractors and consultants towards factors affecting quality of construction project. 62 questionnaires were distributed and 33 are returned. The respondents were asked to indicate their opinion about the quality factors as High impact, some impact and Low impact. The results show that the most important factor agreed by the contractors, consultants, site engineers, project managers etc. are: Material, Conformance to codes and standards, financial issues, Interaction among participants and Design.

The following recommendations are deduced from this study:

1) In order to achieve better Quality work, adopt some programmes such as total quality management, quality assurance, quality control and quality circle in the organization.
2) To minimize the Quality problems through implementation of project planning, designing and controlling throughout the life cycle of projects is required.
3) Design of the construction work should be rechecked by expert at the construction site.
4) Understanding of responsibilities by various project participants.
5) To achieve the client satisfaction, Contractors, consultants etc. should give more importance to the factor, conformance to codes and standards.

REFERENCES
