

Evaluation of Factors Affecting Quality in Construction Projects

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ABSTRACT: Construction projects play a vital role in the development of our nation. Quality is one of the important features in all projects. Success parameter in construction greatly depends on the quality performance. Improvement of quality performance in construction helps to develop the nation. This research mainly focuses on identifying and scrutinizing the factors that affects quality in construction. The identified factors from the literature are design codes & standards, financial issues, planning & scheduling, materials & equipments, human resources, coordination, inspection, risks, types of organization and customer satisfaction. Based on the identified factors a questionnaire is developed and it is surveyed to collect opinion from the construction experts. The collected data are analysed using average index method and it is ranked to get the top most values. The results are based on the survey including 138 respondents which gives the most affecting factor in construction.

KEYWORDS: Quality, Customer satisfaction, construction, average index method, questionnaire.

I. INTRODUCTION

Quality is one of the important aspects of all projects. The level of success of construction projects greatly depends on the quality performance. Quality in construction cannot exist without a project and a construction project cannot exist without quality. The quality of a product or system can be defined as its ability to ensure complete customer satisfaction in totality, which may include all aspects such as comfort, appearance etc. Cost is vital and important in any project. Cost reduction through eliminating wastages, excess consumption, rejection, substandard, rework has to be achieved in all functional areas. These wastages can be achieved by maintaining quality throughout the project. It has been seen that the quality and customer service offered by an enterprise plays a crucial role in the survival and success of an enterprise under the existing environment. Quality is a key to a nation's economy. It is an essential requirement for any product. The quality of an engineering product can therefore be measured in terms of number of characteristics that contribute to an overall performance which satisfies customer's requirements; this is termed as performance characteristics.

II. OBJECTIVE OF THE STUDY

The infrastructure development of a country shows the development of the nation. The service life and durability of every structure also show the development of the nation. The main objective of the project is to study and analyse the factors influencing quality in construction.

III. NEED FOR THE STUDY

Generally quality is essential for every product. Development in construction projects develops the nation. Quality in construction is very essential to increase end user satisfaction. To increase end user satisfaction study and analyses of the factors influencing quality in construction becomes necessary.

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 3, March 2016

IV. METHODOLOGY

Various literatures related to the projects are reviewed. Based on the review, the factors affecting quality are identified which helps to frame a questionnaire. Questionnaire survey is conducted among civil engineers of various companies. These survey responses are analysed using average index method. For the mean values, ranks are provided and this analysis gives the most significant factors affecting quality in construction.

V. IDENTIFIED FACTORS

The identified factors from the review are design codes & standards, financial issues, customer satisfaction, planning and scheduling, materials and equipments, human resources, coordination, inspection, risk, method of execution and type of organization.

a) Questionnaire Design

A questionnaire is designed based on the fact that they had to be simple, clear and understandable for the respondents. The questionnaire consists of two parts; first part contains the respondent profile and second part consists of set of questions based on the factors that are identified from the literature review. The questionnaire is framed as five point ratings which denote the following, 1.Strongly agree, 2.Agree, 3.Moderate, 4.Disagree, 5.Strongly disagree.

VI. DATA ANALYSIS

Prior to data analysis, the reliability of data is done using Cronbach's Coefficient Alpha Method, in SPSS software which is commonly used to estimate the reliability of data. Reliability scores are analysed from the respondents given from the survey. The Cronbach's alpha obtained for respondents is given in Table I.

Table I Reliability Statistics

Cronbach's Alpha	N of Items
0.889	30

Cronbach's alpha value is 0.889. The value must be in the range of 0.6 to 1.0 if the data has to be reliable. Hence here in this analysis the data values are reliable. Questionnaire survey is conducted through mail, post and field survey. From this survey 90 responses were received. These data are analysed using average index method. Ranks are provided for the mean values analysed using this method. Table II gives the mean values and ranks provided for the analysis.

Table II Mean Value for the Factors

S.NO	Factors Affecting Quality	Mean	Rank
1	Design codes are followed in construction	3.1	28
2	Changes in design affects construction	3.37	19
3	Construction cost exceeds the estimated cost	3.3	23
4	Financial problems arise during construction	3.35	22
5	Plan & schedules are revised frequently	3.38	17
6	Resource becomes a reason for delay	3.88	2
7	Delay in supply of materials	3.71	5
8	Inventory levels are checked	3.81	3

International Journal of Innovative Research in Science, Engineering and Technology

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Vol. 5, Issue 3, March 2016

9	Equipments are hired for usage	3.07	29
10	Equipments are maintained properly	3.15	25
11	Labour shortage	3.72	4
12	Experienced labor	3.62	9
13	Proper payment is made to labors	3.38	17
14	Influence of HR in project	3.48	14
15	Conflicts arise for wages	3.26	24
16	Interaction between engineer and owner	3.52	11
17	Coordination among workers	3.89	1
18	Meetings occur frequently in site	3.61	10
19	Inspection occur often	3.66	7
20	Complaints arise after construction	3.36	21
21	Quality engineer plays a vital role	3.43	16
22	Environmental risk play an important role	3.64	8
23	Safety precautions are followed	3.49	13
24	Access to the site becomes risk	3.46	15
25	Latest techniques are adopted in construction	3.11	27
26	Equipment usage increases productivity	3.52	11
27	Proper communication between client and contractor	3.37	19
28	Labors work more than 8hours per day	3.7	6
29	Customer's interaction is satisfied	3.01	30
30	Customer is satisfied with the work	3.12	26

VII. RESULTS AND DISCUSSIONS

Based on the average Index method analysis, the ranking is provided to data. From this analysis, the top ten ranked factors are identified. These are the most significant factor that affects quality in construction. The most significant factors are given in Fig 1.

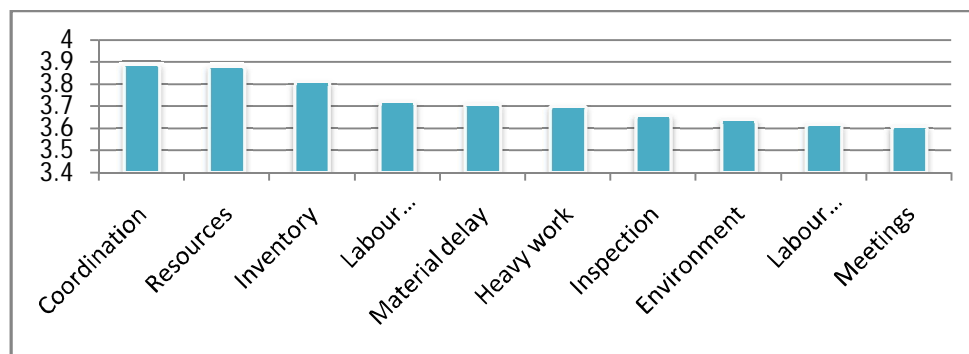


Fig. 2. Significant Factors

International Journal of Innovative Research in Science, Engineering and Technology

(An ISO 3297: 2007 Certified Organization)

Vol. 5, Issue 3, March 2016

The above figure indicates that occurrence of meetings in site is lacking which affects quality. When the meetings occur frequently in site, the faults can be discussed which is used to rectify in the future that consequently increases quality of the work. Environment is also the major factor affecting quality in construction. This factor cannot be predicted but the works can be planned for the time according to the climatic conditions.

Coordination does not exist between the workers due to the changes in culture, religion, etc. Inventory levels should be properly maintained in order to avoid the delay in the project completion. Safety is the important criteria for labours to prevent accidents in the site during work. In case of accidents it affects the respective labour's work and also the co-worker's time that finally affect the productivity of the work.

When the working hours of the labour increases it creates some distractions in the work which automatically that affects the quality of the work. Delays in materials are the important criteria that affects project schedule consequently the quality. These can be avoided by procuring the materials in advance before it gets completed.

VIII. CONCLUSION

The study revealed that the significant factors affecting quality are occurrence of meeting, environmental risks, working hours, material delay, and labour shortage, coordination, checking inventory level, resource delay, coordination and safety precautions. Majorly it can be categorized under labour and material related factors. In construction, labours and materials are to be focused in order to improve productivity which greatly increases quality. Environmental risks cannot be predicted in construction but the works can be preplanned according to the present climatic conditions.

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