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A Study on Factors Influencing Quality of Construction Projects

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Abstract:

The construction industry plays a vital role in the economy. The need for achieving quality of the finished product in the building construction 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'. 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 identify the factors that affect process quality of construction projects and to rank them by degree of importance. Certain construction companies identified and a questionnaire survey was carried out there. Then the data's from the company was collected. The ranking of the factors is done by using Relative Importance Index. Using that data's the major factors that affecting the quality have to be identified. Then from the results suitable suggestions was given to the companies for improving their product quality.

Key words: Quality, Quality assurance, Customer satisfaction, Quality policy

1. Introduction

Quality has become a very popular subject in recent years due to conceptual changes in the industry. Quality and quality systems are topics which have been receiving increasing attention worldwide. The product in any industry should be manufactured to a required standard, one that provides customer satisfaction and value for money. The need for achieving quality of the finished product in the building construction is very important. The high cost of buildings makes it necessary to ensure quality of the finished product. Quality is an essential element for sustainability and customer satisfaction. In construction projects, quality performance is considered as vital for client satisfaction. 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 identify the factors that affect process quality of construction projects and to rank them by degree of importance. 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. Developing a quality system is the first step towards improving quality in construction industry.

For a user, quality is nothing but satisfaction with the appearance, performance, and reliability of the project for a given price range. In the project management, the schedule, cost and quality achievement is also referred to as the iron triangle. Out of these three aspects, the achievement of schedule and cost compliances of the project management is attending the most of the time. This results in a half-hearted attempt to achieve quality at project sites. For project owners, there are many benefits to working only with contractors having formal quality management protocols. For one, working with such a contractor will reduce project costs and completion time, while enhancing safety. For another it will reduce the potential for construction defect and minimizing rework. There are also many obvious benefits to contractors as well. The maintenance of quality management creates a high-performance team atmosphere and a culture of continuous improvement, making it possible to work toward a zero rework environment. As a result, the contractor's reputation for workmanship, efficiency will result satisfied customers.

In this study, it will be studied the factors affecting the quality performance of construction projects. It can be used to measure performance in construction projects. This will be a key component of any organization move towards achieving best practice in order to overcome the quality performance problem in the construction projects.

2. Objectives

The objectives of the present study are as given below:

- To identify various factors affecting the quality performance of construction projects and to rank them by degree of importance
- To suggest ways to improve the quality performance of construction projects

3. Literature Review

Abdol R. Chiniand Hector E. Valdez (2003), The main objective of this paper is to determine whether ISO 9000 is an applicable tool for construction companies in the United States. ISO 9000, the series of quality management standards issued by the International Organization for Standardization, is being used by organizations involved in construction all over the world. A survey was distributed to U.S. construction firms to determine their motivations for certification, the applicability of the standards inside construction organizations, and the barriers that limit the acceptance of ISO 9000 in U.S. construction firms.

Adnan Enshassi, Sherif Mohamed et al, (2009), The objective of this paper is to identify the factors affecting the performance of local construction projects; and their relative importance. The most important factors agreed by the owners, consultants, and contractors as the main factors affecting the performance of construction projects were: material prices, availability of resources as planned through project duration, average delay because of closures leading to materials shortage, availability of personnel with a high experience and qualifications, quality of equipment and raw materials in project and Leadership skills for project managers.

David ardit and H. Murat gunaydin (1998), These people carried out a study to identify the factors that affect process quality. Generic factors that affect process quality are, management Commitment to continuous quality improvement, management leadership in promoting high process quality, quality training of all personnel, efficient teamwork to promote quality issues at the corporate level, and effective cooperation between parties taking part in the project. Industry specific factors are, Drawings and specifications that are consistent, designers and contractors that are selected on merit, communication practices between the parties that are effective and Inspection of quality on the construction site.

John E. Shively (1990), this study is carried out to identify the specific actions that firms take to ensure quality in their organizations. From the study it is identified that the firms taking more care in the following areas for assuring the quality are, Goals and Objectives, Organizational Structure, Public Relations Practices, Office Environment and Technical Sources, professional and technical staff, Professional Development and Employee Advancement.

K. N. Jha & K. C. Iyer (2006), this paper identified the factors affecting the quality performance in construction projects and help to suggest possible remedial measures for improving the quality. Questionnaire survey was carried out and the data's are collecting from large construction industry. From the study the critical success factors obtained were: project manager's competence; top management's support; monitoring and feedback by project participants; interaction among project participants; and owners' competence. The factors that adversely affected the quality performances of projects were: conflict among project participants; hostile socio-economic environment; harsh climatic condition; PM's ignorance & lack of knowledge; faulty project conceptualization; and aggressive competition during tendering.

4. Methodology of Study

The methodology of the study is shown in Fig.1 A thorough literature review was conducted to identify the factors that affect quality as recognized by researchers and practitioners in this field.

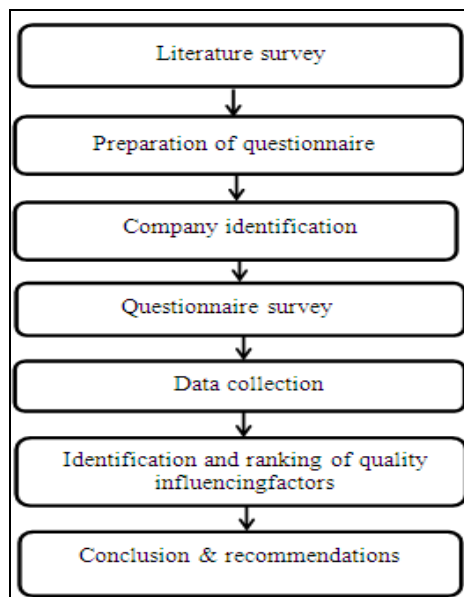


Figure 1: Research Methodology

Questionnaire was designed based on this factors and it was distributed to two groups of respondents, namely contractors and consultants. The survey was conducted and the results were analyzed.

The relative importance index method (RII) was used to determine contractors and consultants 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,

$$RII = \frac{\sum W}{AN}$$

Where,

RII - Relative Importance Index,

W = weighting given to each factor by the respondents (ranging from 1 to 3)

A = highest weight (i.e. 3)

N = total number of respondents.

5. Result and Discussion

The factors which affecting the quality are Design, Lack of communication, Conformance to codes and standards, selection of designer, co-operation of parties, management factors, selection of contractor, top management support, labour, execution, material, equipment, financial issues, quality and safety systems, contract documents. Out of 50 questionnaires distributed 30 were returned. Perception of professionals in the construction industry was investigated. There are some correlation between the contractors and consultants in case of quality influencing factors. The table that contain the ranking of contractors and consultants is given,

| No. | Quality factors | Contractor | |
|-----|------------------------------------|------------|------|
| | | RII | Rank |
| 1 | Conformance to codes and standards | 0.666 | 1 |
| 2 | Selection of contractor | 0.648 | 2 |
| 3 | Financial issues | 0.537 | 3 |
| 4 | Top management support | 0.535 | 4 |
| 5 | Material | 0.518 | 5 |
| 6 | Labour | 0.499 | 6 |
| 7 | Equipment | 0.482 | 7 |
| 8 | Management factors | 0.481 | 8 |
| 9 | Execution | 0.480 | 9 |
| 10 | Selection of designer | 0.463 | 10 |
| 11 | Lack of communication | 0.462 | 11 |
| 12 | Systems(quality, safety) | 0.450 | 12 |
| 13 | Co-operation of parties | 0.444 | 13 |
| 14 | Design | 0.420 | 14 |
| 15 | Contract documents | 0.333 | 15 |

Table 1: Summary of Relative Importance Index and rank of quality factors (contractors)

| No. | Quality factors | Consultant | |
|-----|------------------------------------|------------|------|
| | | RII | Rank |
| 1 | Material | 0.722 | 1 |
| 2 | Labour | 0.685 | 2 |
| 3 | Financial issues | 0.668 | 3 |
| 4 | Conformance to codes and standards | 0.611 | 4 |
| 5 | Top management support | 0.610 | 5 |
| 6 | Management factors | 0.537 | 6 |
| 7 | Equipment | 0.535 | 7 |
| 8 | Systems(quality, safety) | 0.482 | 8 |
| 9 | Selection of contractor | 0.463 | 9 |
| 10 | Selection of designer | 0.445 | 10 |
| 11 | Design | 0.444 | 11 |
| 12 | Co-operation of parties | 0.426 | 12 |
| 13 | Execution | 0.425 | 13 |

| | | | |
|----|-----------------------|-------|----|
| 14 | Contract documents | 0.407 | 14 |
| 15 | Lack of communication | 0.389 | 15 |

Table 2: Summary of Relative Importance Index and rank of quality factors (consultants)

Table illustrates the top significant factors affecting the quality of construction projects. The most important factors according to the perception of contractor and consultant are: Conformance to codes and standards, Materials, Labours, Financial problems. The consultants are interested in clients and technical factors. Consultants observed that the quality of raw materials in project, availability of personnel with high qualifications and conformance to codes and standards strongly affect the quality performance of construction projects.

According to contractors point of view any standard methods and procedures adopted for selecting contractors & subcontractors will improve the quality. And also finance problems will leads to delay of project, this will reduces the quality of work. Introduction and implementation of new management techniques in projects will raises the life of the project and customer satisfaction. Proper inspection throughout the work time will increases the quality and reduces the rework.

6. Conclusion

A questionnaire based survey was used to find out the attitude of contractors and consultants towards factors affecting quality of construction project. 50 questionnaires were distributed and 30 were returned, 15 from contractor's and 15 from consultants. The respondents were asked to indicate their opinion about the quality factors as very important, important and low important. The results show that the most important factor agreed by the contractors and consultants are: Conformance to codes and standards, Materials, Labours, Financial problems.

Quality is an essential element for sustainability and customer satisfaction. The need for achieving quality of the finished product in the building construction is very important. The high cost of buildings makes it necessary to ensure quality of the finished product. Quality is an essential element for sustainability and customer satisfaction. In construction projects, quality performance is considered as vital for client satisfaction. Finding out of these factors will help to improve the quality. Quality training and meetings that is necessary for performing an improvement.

7. References

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