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Development of TQM for Construction Industries

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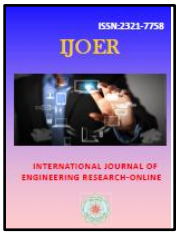

ABSTRACT

This research work has identified and addresses the important issues related to the implantation of Total Quality Management (TQM) in the construction sector. The main aim of the study is to develop and present to the construction companies a new model that could not only improve the understanding of Total Quality Management (TQM) within their sector, but also help in developing the processes, procedures and operations by employing TQM framework in all sections of a company. Therefore, this thesis suggests a model based on existing and new quality management framework in Construction industries. Furthermore, this thesis is a combination of the collected knowledge in different research traditions, and of observed studies of the Construction industry. The aim is to give a complete picture of the materials, technology, regulatory process and innovation and to provide a theoretical model, which can be used for existing and new management framework that maybe implemented in the industry that has been referred as "client" in this study.

The findings of this thesis suggest that TQM can be successfully implemented among construction companies. The conclusions and recommendations are drawn from the best practice of TQM implementation as a guideline for the client construction company to consider in adopting the TQM philosophy. Furthermore, a framework has been suggested for the Client recommending the actions the Client should take to establish and implement a TQM framework, which will increase productivity, streamline the processes and improves the quality of the services and the products offered by the client

INTRODUCTION

Many of the TQM Gurus were simplistic in their presentations and no real account was taken of how the person on the shop floor would apply the principles of TQM which might be easy, in a small two or three man company, but very difficult in a large company employing thousands of people. The principles initiated by the introduction of BS 5750 in 1979 which set out how to establish, document and maintain an effective quality system. Its aim to demonstrate to your customers that you are committed to quality and are able to supply their quality needs DT119931, provided the necessary basic discipline whether you were a company that employed 10 people or 10,000.

WHAT IS TOTAL QUALITY MANAGEMENT?

TQM is a way of managing to improve the effectiveness, flexibility and competitiveness of a business as a whole. It applies as much to service industries as it does to manufacturing industries. It involves whole companies being organised, in every department, every activity and every single person at all levels. For an organisation to be truly effective, all elements must interact together, because every

person and every activity affects and, in tum, is affected by others [Oakland 1990]. Quality is an essential aspect for sustainability and client contentment. In Construction perspective, quality can be defined as meeting the functional, legal and aesthetic needs of a construction project. In the past few decades TQM has been successfully implemented in manufacturing sector of some developed countries; however the pace of acceptance and execution has remained slow in construction. Manufacturing and construction sectors are different in nature. In manufacturing mostly processes are repeated, whereas construction usually takes place in the form of projects i.e. buildings, bridge, etc.

Research background and justification

Achieving the quality in the construction industry cannot be achieved only through our knowledge of the wishes and needs of beneficiaries such as stockholders, customers (internal and external). In order to effectively improve the construction industry in proper and methodological way to fit the changes and developments that are imposed by the current era of globalization and information technology, all parties should participate and supporting to fulfil the Total Quality Management.

Problem Statement

'Guidelines for Quality Management Implementation (ISO9001:2000) for Construction and Consultant Services', in order to assist construction companies in the planning and implementation of QMSs, and with the establishment of related quality documentation.

However, despite these efforts, there has been little positive evidence of improved quality output (Ibid 2007) and, rather it has been acknowledged that there needs to be further support for an improvement in strategies for improving the quality performance of construction companies. Questions which have also been raised in relation to this issue include the following:

- Why does the work undertaken by ISO9001 certified contractors fail to satisfy most customers?
- What are the barriers faced by construction companies when implementing QMSs, and how can these barriers are removed and project outcomes be significantly and continuously improved?
- Why do ISO9001 certify construction companies fail to capture potentially lucrative construction market opportunities?

Objective

With reference to the above research questions, the following research objectives were established, which then became the focus of the research within the context of this thesis.

The specific objectives of the present research work are as follows:

a. To identify the requirement of customers employees and the barriers to Total Quality Management in construction firms.
b. To examine possible steps for restructuring an organization for Total Quality

Management and to develop a Total Quality Management (TQM) approach for Practicing in construction firms as per identified performance parameter.

Research Aim

The research under taken within the context of this thesis was aimed at the development of a comprehensive Culture-based Quality Management System Improvement Implementation Framework for Indonesian contractors and builders, suitable for integration into their own company and project quality management practices, to help achieve better project quality delivery. By providing a framework for the effective implementation and continuous improvement of QMSs by construction companies, it is expected that there would be improvements in customer satisfaction, reflecting the better management and control being applied to construction projects. Organisations could then be expected to begin to move towards operating total quality management practices, which should help to improve their delivery capability of construction projects, and there by also contribute to giving these organisations a greater competitive advantage in local, national and global markets.

MATERIAL AND METHODS

The methodology adopted for the study can be categorized as below:

- Study of literatures related to TQM
- Preliminary survey on the need for study
- Preparation of questionnaire

- Questionnaire survey and personal interviews with the managers and engineers
- Analyzing the questionnaire
- Formulation of result

Data Collection

Large and medium scale companies were selected randomly from all regions of Allahabad. Questionnaire is divided into four parts consisting of 32 questions. The questions are based on the perception of quality, quality management program in the organization, knowledge about TQM, data acquisition methods and training given to the employees. Personnel interviews will be carried out with the management and engineers to reach out the problems in the implementation of TQM in construction companies and to know the commitment of top management in the implementation of TQM.

DESIGN OF QUESTIONNAIRE

A questionnaire was designed to study more about the quality management practices in the construction industry and ways to improve quality in construction works. The questionnaires were prepared with reference of literature reviews and field persons like contractors, engineers, project managers and consultant. Because field people are very well know about, what are all the factors affecting the quality majorly.

Questionnaires are mainly focused on the execution part particularly super structure. Because the quality of construction is majorly misplace in execution part.

Questionnaire mainly divided into five main categories. These are column work, beam work, slab work, brick or block work and plastering work.

Lot of factors affecting the construction quality but in this project I only focuses on major factors like concreting work (concrete quality, pouring of concrete, compaction, curing, etc.), man power, material quality, equipment quality, detailing, etc.

COLUMN WORK

S. No.	Questionnaire	Yes	No	Sometimes
1	Does the column marking is affect the quality?	0	10	0
2	Is there any kind of problem arise due to insufficient reinforcement?	10	0	0
3	Is there any kind of quality problem arise due to poor design?	0	0	10
4	Is there any kind of quality problem arise due to improper shuttering work?	10	0	0
5	Does the improper cover block placement affect the quality of column?	10	0	0
6	Is there any kind of quality problem arise due to manpower in site?	0	0	10
7	Is there any kind of quality problem arise due to equipment used in site?	10	0	0
8	Does the poor quality of concrete is affecting quality of column?	10	0	0
9	Is there any kind of quality problem arise due to compaction of concrete?	10	0	0
10	Is there any kind of quality issue arise due to improper curing of column?	10	0	0

BEAM WORK

S. No.	Questionnaire	Yes	No	Sometimes
11	Is there any kind of problem arise due to insufficient reinforcement?	10	0	0
12	Is there any kind of quality problem arise due to shuttering work?	10	0	0
13	Does the poor cover block placement is affect the quality of beam?	10	0	0
14	Is there any kind of quality problem arise due to manpower in site?	0	0	10
15	Is there any kind of quality problem arise due to equipment used in site?	10	0	0
16	Does the poor quality of concrete is affect the quality of beam?	10	0	0
17	Is there any kind of quality problem arise due to compaction of concrete?	0	0	10
18	Is there any kind of quality issue arise due to curing of beam?	0	10	0

SLAB WORK

S. No.	Questionnaire	Yes	No	Sometimes
19	Does the reinforcement is not providing as per reference drawing?	0	0	10
20	Is there any kind of quality problem arise due to shuttering work?	10	0	0
21	Does poor cover block placement affect the quality?	10	0	0
22	Is there any kind of problem arise related to electrical lining?	0	10	0
23	Is there any kind of quality problem arise due to manpower in site?	0	0	10
24	Is there any kind of quality problem due to equipment used in site?	10	0	0
25	Does the quality of concrete is affect the quality of slab?	10	0	0
26	Is there any kind of quality problem due to compaction of concrete?	10	0	0
27	Is there any kind of quality issue due to curing of slab?	0	10	0

BLOCK WORK

S. No.	Questionnaire	Yes	No	Sometimes
28	Does any kind of quality problem due to improper drawing study?	10	0	0
29	Does the right angle marking is affect the quality of block work?	10	0	0
30	Does the starter course lying is affect the quality of block work?	10	0	0

31	Does the proportion of mortar mix is affect the quality?	10	0	0
32	Is there any kind of problem due to poor quality of brick or block?	10	0	0
33	Is there any kind of problem arise due to not wetting the brick or block before lying?	10	0	0
34	Is there any kind of quality problem due to manpower in site?	0	0	10
35	Is there any kind of problem due to not pointing of joints?	0	0	10
36	Is there any kind of quality issue due to curing of wall?	0	10	0

PLASTERINGWORK WALL PLASTERING

S. No.	Questionnaire	Yes	No	Sometimes
37	Is there any kind of fault due to improper butt on marking fixing?	0	0	10
38	Does Mortar proportion affect the quality?	10	0	0
39	Is there any kind of quality problem due to manpower in site?	0	0	10
40	Is there any kind of quality issue due to curing of surface?	0	10	0

CEILING PLASTERING

S. No.	Questionnaire	Yes	No	Sometimes
41	Is there any kind of problem arise due to not hacking the surface before plastering?	10	0	0
42	Is there any kind of fault due to improper button marking fixing?	0	10	0
43	Does thickness of plastering affect the quality?	0	0	10
44	Does the mortar proportion affect the quality?	10	0	0
45	Is there any kind of quality problem due to manpower in site?	0	0	10

RESULT AND DISCUSSION

During the survey of the firm I collect information from different department and sections of the construction firm. The problems can be summarized as:

The overall purpose of this study was to investing ate how the concept of quality management has been adopted in the construction process. In all my studies on the Allahabad construction sector, I have been struggling with the question of whether the implementation of a TQM programme has some measurable results, or not. It is a delicate question, because no company would admit that their efforts were not profitable but, at the same time, they are not able to show any measurable results of their quality programme. In Article IV, all the companies interviewed were convinced that their quality system paid off, but they could not give many examples that showed how much, in any terms. A number of conclusions can be drawn from the analysis. Although the sample is not designed of the basis for significant statistical inference, the research projects reported have shown some general trends that cover the construction process only, and others covering a relatively long period of time. The positive results are not quantifiable statistically, but have provided information and experience only because of the TQM activities. The conclusions can provide

justification for management in companies in the building sector to make changes that would otherwise have been difficult to implement.

Quality management appears to be considered primarily as a means of increasing effectiveness and enhancing competitive advantage (Article III) but it appears that outside influences, such as a customer insisting on TQM, maybe the force that the company needs to start work on quality management. Management must understand what is involved. To

become a "quality organization" may require a complete change in corporate culture and organizational structure. Because of this, management must be dedicated to the change process. Dedication is required because this is a long process (Federle, 1993).

CONCLUSION

The construction industry has numerous problems in getting quality performance as a result of the complicated nature of the industry. TQM is being increasingly applied to the construction company to solve quality problem. The implementation of a TQM required a culture change and change in management behaviour. Traditionally construction firms are misunderstood and have been set-up wrongly in many organizations. The organization need to shift from their current culture to a TQM culture that focuses on quality as a key strategy. A review of literature, findings and analysis of a case study in different department and sections of a construction firm identifies some important elements that contribute to successful path to implementation of TQM, which include top management commitment, training and education, team work, people management and empowerment, supplier relationship, quality planning and strategic, process management, rewards and recognition and effective communication. These dimensions of quality culture should be adopted by the construction organization in implementing TQM for continuous improvement.

RECOMMENDATIONS FROM CASE STUDY

Based on the analysis of overall analysis and findings the following recommendations can be made for implementing successful Total Quality Management.

1. At first Top Management commitment is a must.
2. Improve Human Resource policy for appropriate recruitment.
3. Improve planning and design phase before starting construction.
4. Improve material quality management.
5. Improve Supply Chain Management.
6. Provide institute training.
7. Optimize the efforts of teams, groups and staffs are as by forming Quality Circles.
8. Encourage education and self improvement for everyone.
9. Follow Juran‟s Ten Steps to Quality Improvement.[Ref. to Chapter 2, Juran‟s Approach to TQM]
10. Emphasize on the strategy, policy, and firm-wide evaluation activities.

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