

STUDY ON NEGLIGENCE OF QUALITY ASSURANCE AND PROPOSING AN EFFECTIVE FRAMEWORK FOR TOTAL QUALITY MANAGEMENT

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Abstract

Quality plays an integral part in the construction industry. Quality assurance is needed because of the involvement of negligence in a project which deduces the quality of the construction. In order to build customer confidence the quality of its work should be done according to the developed quality assurance program. This paper focuses on various negligence of quality assurance practices in the construction industry. The objective of the project is to analyze the various factors that affect quality and quality assurance and to provide an effective framework for the total quality management which helps to increase the quality performance of the construction industry. This project includes a set of questionnaires about quality, quality assurance and total quality management prepared and distributed to various companies and then analyzed. With the help of analyzed data's a total quality management framework has been proposed to reduce the negligence of quality assurance in the construction industry.

Keywords: Quality, Quality Assurance, Total Quality Management and construction etc...

1. INTRODUCTION

Quality has become one of the essential elements in recent years due to conceptual changes in the construction industry. In any industry the product should be manufactured according to the required standard which provides the worth of money and satisfaction of the customers. Quality is nothing but the satisfaction of the customer with the performance, appearance, and reliability of the project for the valuable cost range. In all the phases of the project life cycle quality of construction project is linked with proper quality management. Because of the poor quality management systems lots of failures where occurred. This paper therefore focuses on the total quality management in all the phases of construction projects.

To support the construction projects many of the management practices used are being challenged. Quality management systems and quality assurance are the topics which have been receiving increasing attention. The quality of the construction projects as well as the project success can be regarded as the fulfillment of the expectations of the project participants. The concept of total quality management is concerned to make everyone accountable for their own performance and to get them committed for attaining the higher quality [2]. Total Quality Management is the management approach of an organization, which concentrates on quality based on the participation of its members and aims at long-term success through satisfaction and benefits to all members of the organization and the society[3]. There are different trends and approaches comprised in contracting firms and clients for the adoption of total quality management [5]. Total Quality Management is required because of the fine co-ordination and constructive framework between the organizations, its suppliers and customers and also for its employees.

Quality Assurance is important in the engineering and construction industry because of the risk involved in any project. The performance of the project is affected because of the risk involved due to many external factors and also for not completing the project on time. To avoid any inefficiency resulting in the poor products and service which are delivered to the customer, it is important to develop a built-in quality assurance system[7]. Internal and external aspects are involved in the quality systems. Providing confidence to the management of an organization that the required quality has to be achieved is the aim of the internal quality system. And for inspiring the confidence in the client and to satisfy the client's quality requirement is the aim for the external quality systems. This system is called the Quality Assurance systems [6]. In developing countries, on relying on the ISO 9000 and 14000 standards the quality assurance in the construction sector has been in practice for quite some time as they have been implementing TQM practices in the building and also in construction industry.

In this study, it will be studied about the identification of various negligence of the quality assurance systems in the existing construction projects. A questionnaire is prepared based on the quality and negligence of quality assurance systems in construction industry.

2. AIM OF STUDY

The aim of the study is to find out the negligence in quality assurance and to propose an effective framework for the Total Quality Management

2.1 Objectives of the Study

The specific objectives are:

- To understand the importance of quality assurance in the construction industry
- To identify the effective quality management for the particular project
- To provide a detailed framework for TQM.

2.2 Scope of Study

This project focuses on the quality assurance and Total Quality Management in the construction industry. The main concept of this project is to develop a framework for Total Quality Management by eliminating the various negligence in quality assurance which is identified during the construction of the existing projects.

3. LITERATURE REVIEW

In recent decades, due to the competitiveness in the market places worldwide companies have realized that a good product quality is a key area for the commercial success and its development. Several methods have been emerged under the Total Quality Management umbrella. However to date, associated research in the construction sector has received little attention by comparison to say, manufacturing. Some approaches have been proposed for use in construction has limitations with regard to their applicability. A framework has been developed which includes quality policy, products and service quality to help quality in projects (David Joaquin Delgado 2008). TQM inclusion in construction industry helps to increase the quality of the product which forces the construction firms to implement the system. The aspects that were targeted such as quality in the organization, employee training and organizational culture, seems appreciable. Lacking of having a concise and exact definition of quality was also observed. The fragmented nature of the industry is a big hurdle in TQM application. Lack of education, negligence and irresponsibility are also critical issues which should be prevented. Implementing TQM requires a major transformation in the organization (Rizwan U 2008).

Even when approved plans exist, the developers/owners refuse to follow standards and specifications as contained in the plan and cut corners probably because quality assurance is not always a cost effective activity though it is essential if fitness for purpose is the measure of performance and where the satisfaction of the client or customer is to be placed first and foremost. Quality assurance is firmly dependent upon clients knowing their specific needs and communicating these unambiguously to the designer, upon the designer accurately representing these requirements in the design concept, upon the contractor faithfully reproducing these requirements in the work on site, and taking quality assurance to its end, upon the occupier using the building correctly to achieve maximum performance (Griffith, 1990). After the tsunami disaster and terrorism srilanka construction industry showed a study growth in their construction processes. Numerous building construction projects have been started and some are about to start

because of the sudden rise of economic growth, urbanization and resettlement. As a result, the demand for building materials, manpower and machinery requirements have shown a considerable increase. Poor quality leads to structural failures. To avoid these type of factors quality assurance system has been developed (G L Chandrasena, 2008).

To examine the effectiveness of the construction industry, quality assurance system is developed to address the public concern, safety, durability and functionality. The identified major problems where inadequate budgetary allocation for quality control, non-enforcement of quality control clauses by authorized agencies, insufficient quality control laboratories. So addressing these problems will greatly improve the level of quality assurance in the industry (Y.A. Abdul Kareem 2006). The factors affecting the quality performance in construction projects where conflicts among project participants, hostile socio-economic environment, bad climatic conditions, project manager's ignorance, faulty project conceptualization and aggressive competition during tendering. So to rectify the factors possible remedial measures has been suggested to improve the quality (K.N. Jha 2006).

Recently several organizations have restored to the application of total quality management with the view to assessing the level of quality and to improve it. This total quality management process is considered as a modern system in the field of quality, after the quality assurance, quality control and ISO in the construction sector. The important factors were taken into account relating to the internal customers of the companies. The finding of the study is that these organizations generally take into account the principles of total quality management (Abu Hassan Bin 2011).

4. METHODOLOGY

The first approach, a literature review was done to extract list of factors affecting quality and also the negligence in the quality assurance systems from previous study.

- The second approach is to identify the concept of Total Quality Management and quality assurance.
- The third approach is to prepare an questionnaire based on the various negligence in quality assurance and distributed to a set of companies.
- The fourth approach is to collect the relevant data's needed for the process and also collects the distributed questionnaires from the respective companies.
- The fifth approach is to analyze, evaluate and rank the collected questionnaires with the help of SPSS for statistical analysis.
- The sixth approach is to develop a model framework and implement it in the current construction projects.
- Based on the knowledge gained on the literature study the project is carried out with the following flowchart.

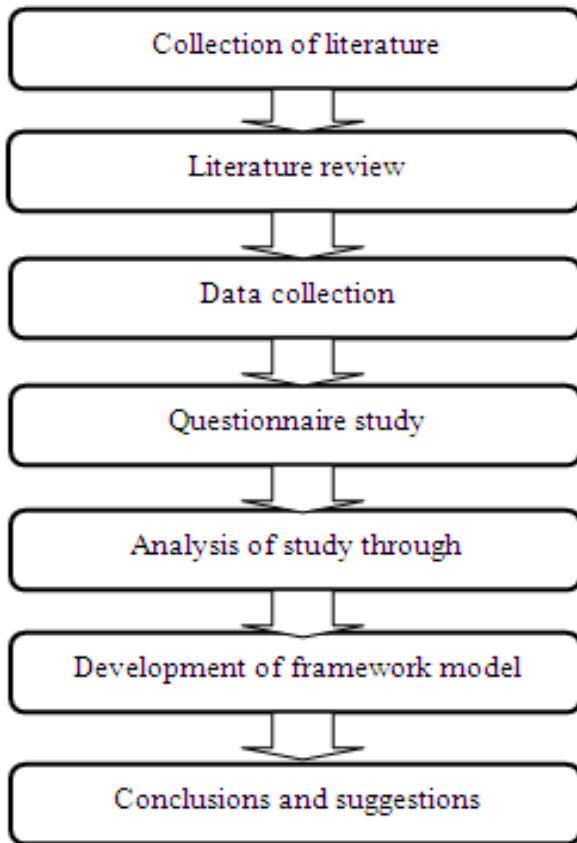


Fig -1: Methodology

5. STUDY ANALYSIS

5.1 Questionnaire Responses

This study comprises professionals in consulting, contracting, engineers, project managers, quality engineers has been involved. This resulted in a total questionnaires of 50. Out of 50 questionnaires distributed 40 were returned and the analysis has been done.

Table -1: No. of respondents

Questionnaire	No	Percent
Total Distributed	50	100
Total Returned	40	90
Not Returned	10	10
Used for the Study	40	90

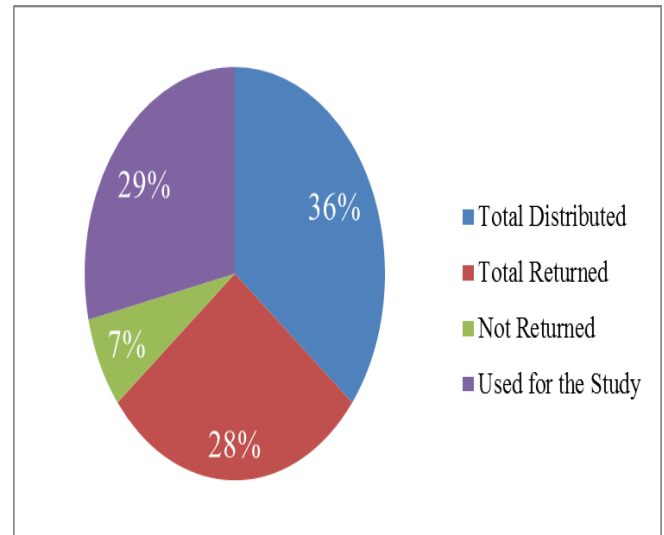


Fig -2: No. of respondents chart

The results of the analysis in table 1 shows that ninety percent of questionnaires administered were duly completed and returned. This result is regarded as high. Therefore, the responses got from the organizations of the study to the questionnaire administered are regarded as encouraging.

Table -2: Percentage of Respondents

Organization	No	Percent
Project Manager	8	20
Site Engineer	9	22.5
Planning Engineer	7	17.5
Contractor	6	15
Quality Inspector	10	25

Table 2 shows that 20% are project managers, 22.5% are site managers, 17.5% are planning engineers, and contractors are 15% and 25% of quality control engineers. This shows that QC engineers were the highest respondents.

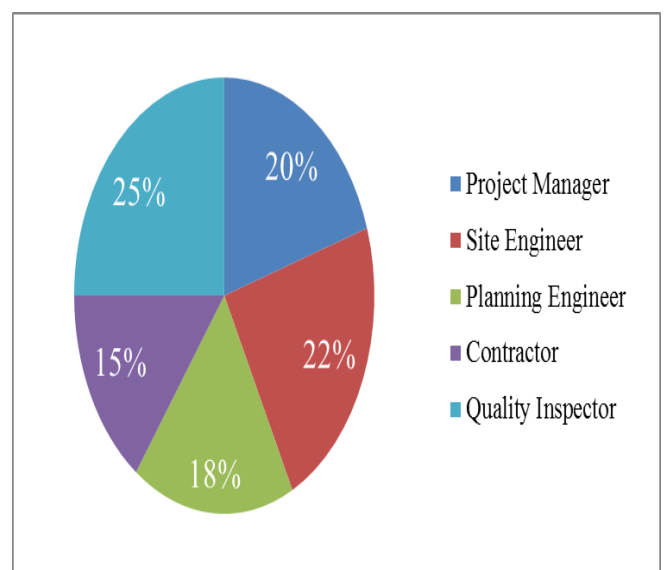


Fig -3: Percentage of Respondents

5.2 Negligence of Quality Assurance

A variety of authors have provided different categorizations of quality problems, but there have been few attempts to collect together and identify the major sources of negligence in quality assurance in a comprehensive manner. With the help of the reviewed collected literatures the most notable negligence of quality assurance have been identified. The questionnaires collected from the companies are analyzed using SPSS statistical analysis program. The negligence in quality assurance are inadequate supervision and verification on site, use of superseded drawings and specifications, poor workmanship during construction, Quality Assurance sampling and testing may increase in workload, cost overrun on projects, inadequate commitment to service quality by contractors. (Ranked as per SPSS analysis). Out of 50 questionnaires distributed 40 were returned and the analysis has been done.

3	Poor workmanship during construction	4.450	3
4	Quality assurance sampling and testing may increase in workload	4.375	4
5	Cost overrun on projects	4.325	5
6	Inadequate commitment to service quality by contractors	4.200	6
7	Misinterpretation of drawing and specification	4.150	7
8	Poor coordination of subcontracted work	4.000	8
9	Untimely project Delivery	3.950	9
10	Structural failures leading to death.	3.775	10

Table -4: Summary of SPSS and rank of negligence of Quality Assurance

S.No	Description	Mean	Rank
1	Inadequate supervision and verification on site.	4.675	1
2	Use of superseded drawing and specification	4.600	2

Table -5: Likert scale for analysis

1	Strongly Disagree
2	Disagree
3	Neutral
4	Agree
5	Strongly Agree

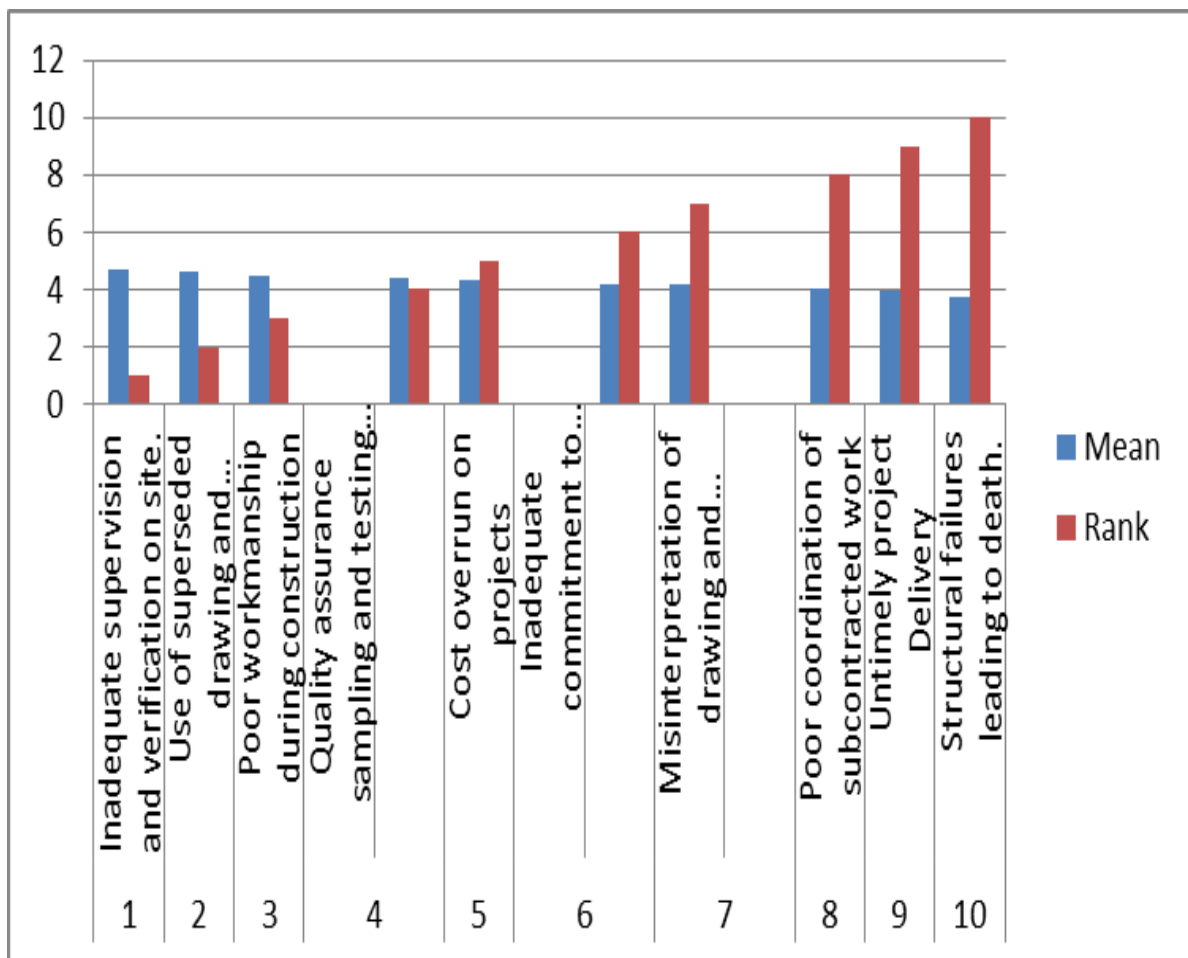


Fig -4: Bar chart for the analyzed results

6. FRAMEWORK REPRESENTATIONS

The essential requirements for the development of framework as to be identified to create a schematic representation this framework is developed based on the TQM model. With the help of the questionnaires received from the organizations the quality assurance the most notable negligence factor has been identified and rectified accordingly.

The factors which affect the most are inadequate supervision and verification on site, use of superseded drawing and specifications, poor workmanship during construction, quality assurance sampling and testing which increases the workload, cost overrun on projects and inadequate commitment to service quality by contractors has been rectified using Total Quality Management system with four different processes which are quality management program, improvement suggestions in organizations, top management support, self-motivation towards continuous improvement.

6.1 Discussions of Findings

The analysis of respondents pursued opinion on who should be largely responsible for enforcing/ensuring effective quality assurance practice in construction reveals that management of companies, professional bodies and even construction clients all have major rolls to play in quality assurance in construction.

The advent of total quality management can be seen as timely in the research for productivity improvement and customer satisfaction. It is not feasible as a basis for acceptance that a performance testing would be done in an construction. Setting up of quality assurance department in construction firms and providing trainings and seminars on quality assurance should be provided and penalty for non-compliance of quality standards should implement. Hence in quality assurance testing and sampling should be conducted.

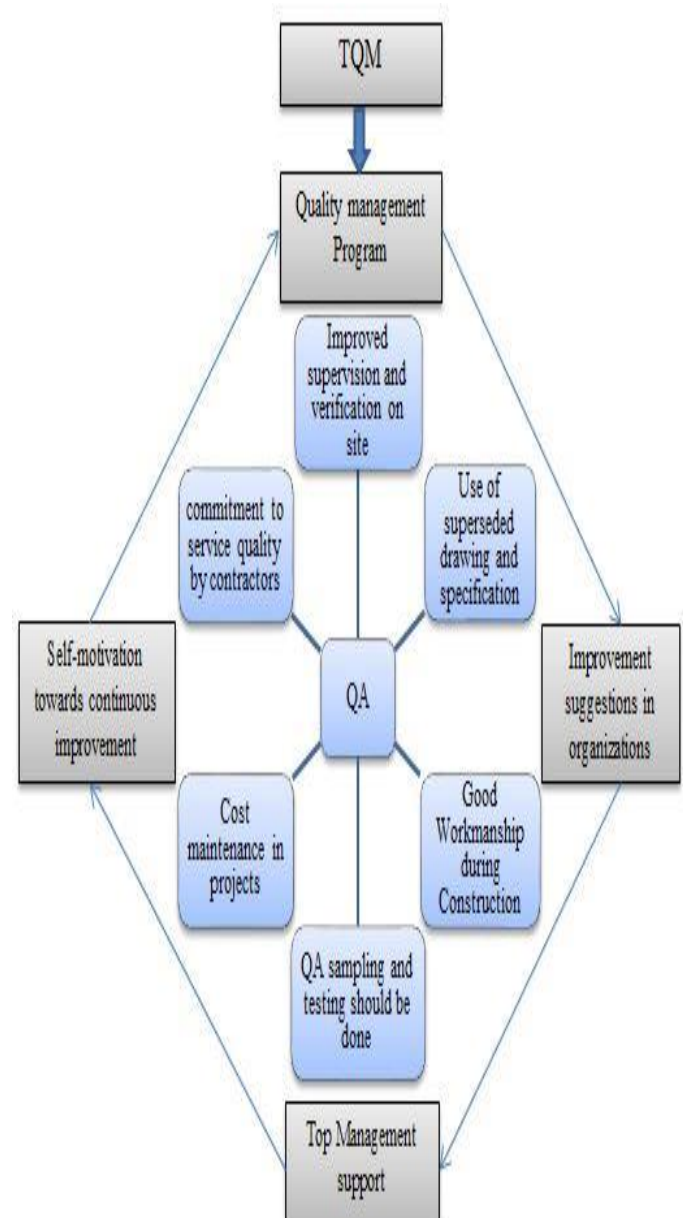


Fig -5: Framework for TQM

7. SUMMARY AND CONCLUSION

In conclusion, the top ranking grades in construction practices the variables and the dimensions of Total quality management works to some extent. In effectiveness and significance value in each dimensions and each part there is a difference which always exist. From the results achieved the most of the negligence of the quality assurance are significant and should be practiced.

From this framework process the negligence factors under quality assurance which are inadequate supervision and verification on site, use of superseded drawing and specifications, poor workmanship during construction, quality assurance sampling and testing which increases the workload, cost overrun on projects and inadequate commitment to service quality by contractors have been solved.

To increase the performance in the quality management in an organization suggestions should be collected from the employees contactors also from clients and should get approval from top management should be successfully implemented in quality management program so that there should be a continuous improvement throughout the quality management program.

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