

# “Assessment of Total Quality Management in Construction Firms” - A Review

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**Abstract**— Quality control is very important to consider in any construction project. This paper demonstrates the quality management methods of construction works. The Indian government announces plans and policies to increase the quality of construction work. The main purpose of this study is to determine the highest quality of construction work and to provide the highest quality of service to the community and to meet the needs of all involved in the construction work. Little research work was done and studied to identify problems of applying quality management to the practical and current nature of the construction project. Analyzes and conclusions from the questionnaire survey and data analysis were conducted from qualitative research, issues related to contractor quality management in construction firms' projects.

**Keywords:** Quality Management, Construction Project, Quality Management, Total Quality Management

## I. INTRODUCTION

Rapid technological advancements lead to an increase in productivity and increase the number of firms in the market. The increasing number of alternatives in the market enables consumers to make comparisons between products depending on its quality at no price. To survive in this competitive environment, firms must reach customer satisfaction by ensuring the size of the triangle of time, price, and quality. Quality is often seen as the 'end product quality' but in reality, it brings many benefits to firms, e.g. reduced waste, saved time, increased profitability and reduced labor and safety problems. Today, successful firms incorporate quality at all levels of their production from production to sales and even after-sales technical support and accept it as a management philosophy. This quality-based philosophy is known as Total Quality Management (TQM). TQM was initially adopted in the manufacturing industry, and at the time, it was trying to get accepted into other jobs.

In the field of construction, unique to each project, diversity of staff, multiple stakeholders, and the effects of various factors such as weather conditions and formal rules on projects make the use of TQM extremely difficult. According to the literature review, Indian construction companies does not have enough knowledge and experience with TQM and are using it for promotional purposes. Total Quality Management (TQM) is an effective way to improve quality performance, business performance, organizational performance, new performance, and execute strong performance. TQM has been established in the manufacturing industry and has gained wide acclaim for its remarkable performance, such as increased productivity, decreased product costs, and improved reliability. As a result of the successful launch of TQM in the manufacturing

industry, it has become a source of innovation for other industries to embrace and apply this concept, including the construction industry.

## II. LITERATURE REVIEW

Firas Mohamad Al-Sabek (2015): The aim of this paper is to look at the most important and important factors that will affect the implementation of Total Quality Management (TQM) in the construction industry in the United Arab Emirates. It also evaluates the projected outcome of the Project from implementing TQM. The framework was also proposed in terms of literature studies. The method used in his paper is a numerical study. The survey was conducted with a sample of 60 respondents and disseminated to a construction company in Abu Dhabi, which included 15 surveys of the most important factor that would affect the implementation of TQM in addition to the project's most impacted implementation on TQM. Studies have shown that management's commitment is the most important factor in implementing TQM in the construction company. It has also been shown that the cost of the Project is very effective in implementing TQM. [1]

Jamal M. Assbeihat (2010): Since the Construction Industry is an important economic sector in Jordan, this work is undertaken to identify the elements that shape the contractor's vision and engineering offices and prevent them from adopting the TQM process in Jordan. The questionnaire was composed of two methods of data collection. It was organized into three main groups; each group consists of three small groups. Appropriate mathematical methods are adopted for analysis and comparison. The results showed that many construction firms had difficulty distinguishing TQM and ISO. Most have a bad habit and idea of using TQM. Various factors, especially cost, prevent construction firms from implementing TQM. Functional factors that encouraged a positive attitude were to ensure the customer's commitment and provide a better work environment. [2]

TQM High Quality Managers (TQM) is a management philosophy widely used in the manufacturing and other services industries, and shows how to improve quality in these sectors. Savita Sangle et.al (2017) focused on the goal to show the latest lessons that focused on increasing the quality of business through the implementation of TQM in the construction industry and its proper functioning at various stages of project development and outlines the basic vision of six sigma, goals, methodology, and various tools are used to reduce errors. A case study of residential building is undertaken when 7 QC tools are implemented using the DMAIC criterion. Six sigma measures have been taken to improve quality. The findings suggest that appropriate training and management

support and small changes in the current operating system can help improve the quality and ultimately the highest customer satisfaction. [3]

Tan Chin-Keng et.al (2011): This study first considers quality management activities, commitment to quality control management, and quality management issues in construction projects in the context of the Malaysian construction industry. This study employs a well-structured interview process consisting of 12 project management staff. Findings of this study indicate that the quality management environment in construction projects in Malawi needs to be strengthened and there are problems with the implementation of quality management that require more attention and research. This paper provides an insight into the nature of quality management in construction projects in Malawi. [4]

Peter Hoonakker et.al (2010): In this paper they discuss the problems of defining quality in the construction industry, explore the potential benefits of using quality, and look at barriers to quality use in construction. We use data collected during interviews with contractors and data from the questionnaire. The results show that contractors understand the potential benefits of quality use but there are also many barriers to implementation. We describe recent developments that can help overcome obstacles. However, various actors in construction need to understand that change is a slow and painful process and that a great effort is being made to achieve quality in the construction industry. [5]

Saurin Kakkad (2014): Total Quality Management (TQM) is an approach that seeks to improve the quality and functionality that will meet or exceed customer expectations. This can be achieved by integrating all quality related activities and processes across the company. TQM looks at the quality methods used by the company including managing quality design and development, quality control and maintenance, quality improvement, and quality assurance. TQM looks at all the quality measures taken at all levels that include all company employees. [6]

Mr Nikhil M Arane et.al (2018): In the construction literature, the results of Total Quality Management have been appreciated by many researchers. The main purpose of this study is to emphasize the quality of the Water Quality Building System. While, Sewer construction is followed by a lack of Management, Strategies for improving the system, customer satisfaction. In this study, a study was conducted under "Pune Municipal Corporation" (PMC) Pune, India. Here the basic quality tools were used to analyze the data collected, to solve the problems faced by the Engineers during the Construction, with the ability to add other Building Management Services. Nearly everyone in the organization is involved in improving the quality of the process, services, product or culture. [7]

Pravin P. Mane (2015): The main purpose of the construction industry is to ensure that the construction projects are completed successfully within the constraints of high quality, deadlines and possible low cost. QMS-based research suggested that construction companies should create a flexible and healthy environment for an organization that promotes the development of a quality management system in all areas of their work. The

questionnaire was conducted in the current study by taking interviews of project participants. Project participants include the owner / builder, project management consultant, contractor, various suppliers and suppliers. The questionnaires were prepared by the authors based on the relevant factors in the construction of the contractor / contractor, consultants and clients / occupants of the building. This paper describes an analysis of data collected during interviews and interview questions with the contractor / contractor. [8]

David Arditi et.al: There is a good chance of quality improvement in the construction process. Literature and research studies conducted in the USA have shown that a commitment to quality management and continuous quality improvement are of utmost importance; workers in the construction industry are well aware of the importance of quality training; Collaboration agreements between construction process teams constitute an important step in securing a high-quality product; the response logo can improve the quality standards used in the industry; Specification of project scope and requirements and drawings and specifications are requirements for high quality of the process. [9]

With the advent of existing liberalization policies, customization and globalization the economic climate has changed completely over the past decade and a half. With the continued penetration of Multinationals and the tendency to achieve global protests, our construction companies have to face stiff competition both domestically and overseas to win contracts. They must compete in terms of cost, time (Schedule) and quality of the construction project that will be at the forefront of the opposition. Mrs Sushma Kulkarni has shown that when we study the complete construction process of a particular project from the very beginning of the concept to start and finally make and make it open to use, at each stage quality management is required to obtain the final product. with full quality thus having zero aspect from the customer's point of view. In this paper TQM philosophy and key elements of the implementation of the TQM process are discussed in terms of the construction industry. [10]

D. Ashokkumar (2014): The construction industry plays a major role in the development of any country. The development of the construction industry depends on the quality of construction works. Quality is one of the key to the success of construction projects. Quality improvement of construction projects is linked to quality management in the project life cycle. Although quality management at all stages of the project cycle is important, quality management in the (construction) phase of the phase has a significant effect on the final quality of construction projects. This project mainly considers the importance and factors affecting quality management in the operational (construction) phase. The project involves visiting other construction companies and conducting a questionnaire, then analyzing the difficulties (major factors) and cost variations due to a quality defect in management and suggesting some steps to improve the quality in the project implementation phase. [11]

Solomon Oyebisi (2019): An acceptable level of quality in construction projects creates a problem. Major resources are wasted on construction projects due to

inefficient or poor quality management processes. Therefore, this study examines quality management and quality planning methods in building materials with a focus on the Convention University Sports Complex. The quantitative research strategy and questionnaire was used as a data collection tool for obtaining data from project participants in order to obtain the best key for high quality management. It was found that management's commitment to quality is the most important factor in the application of effective quality management to the construction project. From this, it is assumed that the quality factor and the homogeneity of the concrete in the column of reinforced concrete, the rows and slabs range from "good to excellent concrete". These findings will help project participants achieve quality management and operational efficiency while performing construction tasks. [12]

Akshara Mahesh et.al (2018), TQM is a way to provide value to the goals, people and processes to ensure that the right things are done at the right time as they help to achieve set standards and successful production activities. TQM helps to avoid problems in the construction industry such as job creation, deficiencies; Cost and time TQM is a tool adopted by manufacturing companies to improve the overall quality of products and services in the manufacturing sector. The first aim of this paper is to determine whether TQM has an impact on the quality of construction. Productivity level was measured by the components Integrity, Ethics, Recognition, and Trust. In the same way building quality is measured, using inventory management, time management, supply chain management, and technical management. Sample size taken by 25 construction companies. Information was collected through a questionnaire. The results obtained indicate that TQM practices have an impact on the quality improvement of construction companies. [13]

### III. METHODOLOGY OF WORK

- 1) Further literature research has been done on reference books, technical research papers, journals etc. understanding basic concepts on this topic. Web search is done through numerous journals such as "TQM implementation in the construction industry", "Research on the Challenges of using TQM in construction companies", "TQM requirements in the construction industry", "Implementing
- 2) TQM in the construction industry", "Implementing TQM for Improvement Organizational Performance" etc.
- 3) The next step is to identify the need for study or feasibility of the literature gap.
- 4) Collection of information needed for the complete quality management of construction projects. This data collection is based on a questionnaire and in-depth interviews with various industry professionals.
- 5) Analysis work must be done. It means that the analysis of the data collected above is made up of details of derived from the above work is analyzed with the help of interpretation and definition of reliability.

### IV. CONCLUSION

From the above review it is concluded that there is great potential for quality improvement in the construction industry. In today's competitive world, the term 'quality' and its concepts are vital for the construction industry. There is not much time or resources to waste. Reworks and delays are not acceptable. As in the manufacturing industries, the construction industry should focus on process quality. It is clear that TQM and its principles do apply to the construction industry. TQM philosophy of teamwork and co-operation not confrontation and conflict, is long overdue for the construction industry. Management commitment to quality and to continuous quality improvement is very important in each phase of the building process. Management must participate in the implementation process and be fully committed to it if TQM is to succeed. Construction industry professionals are aware of the importance of quality training. Engineering, architecture and construction management students who eventually become the industry's future leaders must be instructed in the basics of quality management. Education and training in TQM theory and practice at all levels (management as well as operative levels) and in all phases (design, construction, and operation phases) are essential to enhance competitiveness. Teamwork is necessary to allow each person to get the assistance required to be successful individually, and collectively as a team. The whole construction industry is project oriented; so improved quality performance must be project-related and must include the whole project team. The construction project should be considered as a process where all customers must be satisfied.

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