BARRIERS IN IMPLEMENTING TOTAL QUALITY MANAGEMENT (TQM) TOOLS IN CONSTRUCTION INDUSTRY

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ABSTRACT - The objective of this research is to identify the Total Quality Management (TQM) tools and barriers in implementing critical success factors (CSFs) of TQM such as a lack of budget allocation and broad corporate vision, lack of training for quality improvement numerous others. It is usually employed in top organisations with a high reputation in the market for business in terms of quality. In some parts of India, well designed questionnaire survey has been taken in this survey from well-known Organization of the construction industry. This survey attempts some general techniques of Quality related questions. The data taken for the study is primary in nature. The result of this study indicates that, in most organisations check sheets and flow charts are commonly used tools. The key objective of TQM is to enhance the customer experience by continuously improving products and reducing defects through the whole involvement and dedication of those that are involved in the process, as well as to strengthen brand image. Too much document commitment and lack of understanding of top management towards quality are the obstacles faced by the stakeholders. Unfortunately, the construction industry has been slow to adopt TQM compared to other industries.

In open systems, it's difficult for developers to expand their plan due to highcompetition, thus quality is thekey to attract clients and delight them. It is clear from studies, that the application of TQM in construction industries is mostly in western countries. TQM is not transparent in Indian organization they apply old rules of quality like quality assurance, quality management. Many companies find it difficult to apply.

Keywords: Total quality management (TQM), Critical success factor (CSF), Quality management systems (QMS), Quality control (QC), Quality assurance (QA)

INTRODUCTION

Inflation becomes major concern in all over the world. By rising of inflation, somewhere quality varies owing to not compromising a quality is a vital part. India is now following suit. Good Quality reduces cost because of products returns, reworks, scrap. It also increases productivity, profits and other measures of success.

Customers plays vital part to the success of any organisation. A corporation must plan ahead of time and track quality features and services before supplying any services or products. They must plan properly from the customer's perspective. The identification of the customer's needs, the transcription of those needs into proper notes, the development of a product to meet those needs, the optimization of products from both the customer's and the company's perspectives, the development of the manufacturing process, the optimization of products by reducing waste, and finally proving it to customers by providing the best quality are all important steps in quality planning[1]. While delays and flaws are unavoidable in construction, far more so than in a highly regulated industrial setting, TQM necessitates a shift in employee mindset from monitoring to constantly seeking methods to improve.

TQM (TOTAL QUALITY MANAGEMENT) DEFINITIONS:

This is very popular term in manufacturing & service sector. The quality development, quality maintenance & quality improvement efforts of various groups of organization to enable production & services at economic level for customer satisfaction. It is the process of detecting & eliminating errors in construction wastes, production, supply chain management, etc. with customer's satisfaction.

ISO family: ISO 9000 includes the following standards-

ISO 9001: -The international standard for quality management systems (QMS). This criterion is used to indicate an organization's capacity to consistently produce products and services that fulfil consumer needs.[2]

ISO14001: -The international agreement on the requirements for an environmental management system. It assists the company in improving its environmental performance through effective resource utilisation and waste reduction, resulting in a competitive advantage and stakeholder trust.

ISO 14002: -This document provides topic-specific recommendations and examples for organisations that want to use their ISO14001 environmental management system to address a more targeted set of environmental issues.

ISO 9000 QUALITY MANAGEMENT PRINCIPLES

Customer Focus: - The foremost important principle owing to customer buying process. The main logo of any business is to fulfil the needs of customers and figuring out their level of choices.[3]

Total employee commitment: -Employee is the second foremost important part of any business. Without total commitment of all employees, you cannot increase productivity, processes, sales. They must have to be trained to complete the task and reach the goals on time. Encourage employee to self-evaluate any problems and move them to seek opportunities by increasing their knowledge and experiences.

Process approach: - Proper well-mannered process is vital part to fulfil any demand in right time. There are various tools such as processes flowchart to define the proper responsibilities of everybody. Another option is to create visual action plan so everyone can easily achieve the goal.

Integrated system: - In businesses anywhere in the organization everyone can be internally connected with each other in horizontal way. In this system every department should have some understanding of standards, processes, policies & objectives. This is very helpful to stay in the competitor market. To solve this training is one of the options to people aware.
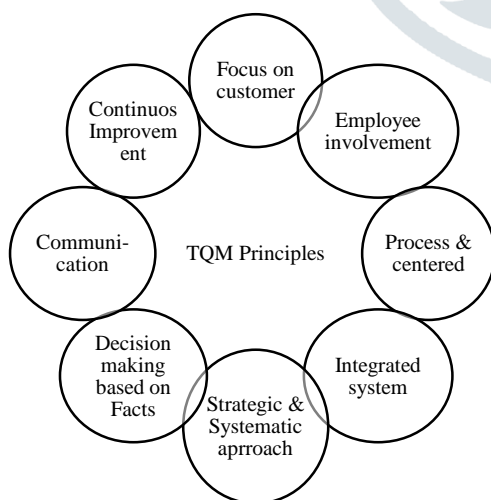

Fig. 1:TQM Principles

Strategic and systematic approach: - ISO (International standard organization) introduces this principle. All the interrelated problems must have to be solve in systematic way by identifying, understanding & managing the processes. Make continuable improvement and give training to employees to complete the steps in proper way.

Continual Improvement: "You cannot complete the whole food in a single time complete it in continual manner" Phrases. In any business complete the work in continual way with improve process and adaption of new techniques to give satisfaction to customer. To solve this issue always encourage the employees to accept the innovations and learn to take new roles and responsibilities.

Fact-based decision making: - To take any type of decisions proper and correct data is necessary then analysis the problem by valid methods to make decisions correct.

Communications: - Everybody should be aware of any works, their strategies, plan, policies in updated manner. Communication is vital to take low risk of failure in organization. Also make sure that everyone can understand their roles and properly fit for our organization.[3][2]

LITERATURE STUDY

Terminologies:

Quality Planning: - ISO 8402 defines quality as degree of excellence like serviceability, maintainable, etc.

Quality Improvement: - Product enhancement, process enhancement, and people-based enhancement are the three components of quality improvement methodologies. Quality management and approaches can be used in a variety of ways. Kaizen, Zero Defect Programs, Six Sigma, Quality Circle, ISO, and Top Down and Bottom-Up, etc.

Quality Management System (QMS): - ISO 9001 is a globally recognised Quality Management System (QMS) standard that can assist businesses of all sizes. Certification in quality management can allow you to: Continuously improve, streamline operations, and reduce expenses.

Quality assurance (QA): -Quality assurance, defined by ISO 9000 as "component of quality management focused on providing confidence that quality criteria will be fulfilled," is a method of eliminating mistakes and flaws in manufactured items and avoiding problems when delivering products or services to clients.[4]

Quality control (QC): - Quality control entails inspecting units to see if they meet the final product's criteria. The goal of the testing is to see whether there are any issues that need to be addressed in the production process. Quality control is defined by ISO 9000 as aspect of quality management focused on meeting quality requirements.

Quality Management: - The act of managing all activities and tasks that must be completed in order to maintain a particular degree of perfection is known as quality management. Total quality management: Total quality management seeks to hold all parties engaged in the manufacturing process responsible for the final product's or service's overall quality.

Table 1:Critical Success Factor for "TQM"

S. No	Success Factors	Definition
1	Top Management Commitment and leadership for quality Management	The new standard (ISO 9001:2015) demands Top Management to demonstrate effective leadership through involvement and engagement with meeting the standard[1],[5].
2	Employee Satisfaction, involvement, encouragement and evaluation	Employee satisfaction surveys may tell you how employees feel about their work environment, whether they are glad to work for the company, what influences their well-being, and what particular advice they have for resolving problems[1],[5].
3	Quality Assurance by Preventing rather than detecting defects	QA focuses on the product's manufacturing process to prevent flaws. It's a proactive approach to quality. The goal of quality control is to find (and fix) flaws in the final product. As a result, quality control is a reactive process[5].
4	Engineering Process management	Engineering and project managers can use process management to think about project organisations in a holistic way, using Semantics concepts and logical frameworks to plan, execute, analyse, and learn about them[5].
5	Human resource	The HR department uses feedback to evaluate work or processes. Feedback is a method of

management and Measuring Feedback of employees	gaining insight into an organization's needs, requirements, and performance[5].

METHODOLOGY

RESEARCH STEPS

The top 20 organisations of construction companies in several parts of India completed the questionnaire survey digitally. Stakeholders in the organisation had framed TQM-related questions. The content analysis steps: 1) Descriptive analysis of formal characteristics, using Microsoft Excel worksheet 2) find the reliability statistics by the Cronbach's alpha coefficient 3) correlation of top five CSF with the help of the SPSS (Statistical Software for the Social Sciences)[6]. 5-point Likert scale was used (1 = extremely lowest, 2 = Lowest, 3 = indifferent, 4 = Highest, 5 = extremely highest)[7].

Data Collection & Analysis:
The organization's best definition of quality is satisfying internal process managers (inside the organisation) and satisfying external customers (outside the organisation), both of which receive 39 percent. TQM's well-known stakeholders account for about 75% of the total. At the Indian organisation, TQM procedures are used by 70% of stakeholders. The only two TQM quality tools that are most commonly utilised are the check sheet and flow chart. As a result, switch into barriers instead success.The ISO is the only quality technique used by the organisation, accounting for 85 percent of the total. ISO 19001 is the most widely used quality management system certification. The main benefit of applying TQM at the organization is customer satisfaction (29 percent) and brand image strengthening (26 percent). Typically, the organization's fundamental TQM discussion occurs with both senior and field workers. Obstacles faced while implementing TQM at organization stakeholders must overcome challenges such as excessive document work (30%) and misunderstandings caused by miscommunication (28%). According to the survey, a multidisciplinary team is required to increase the organization's quality.
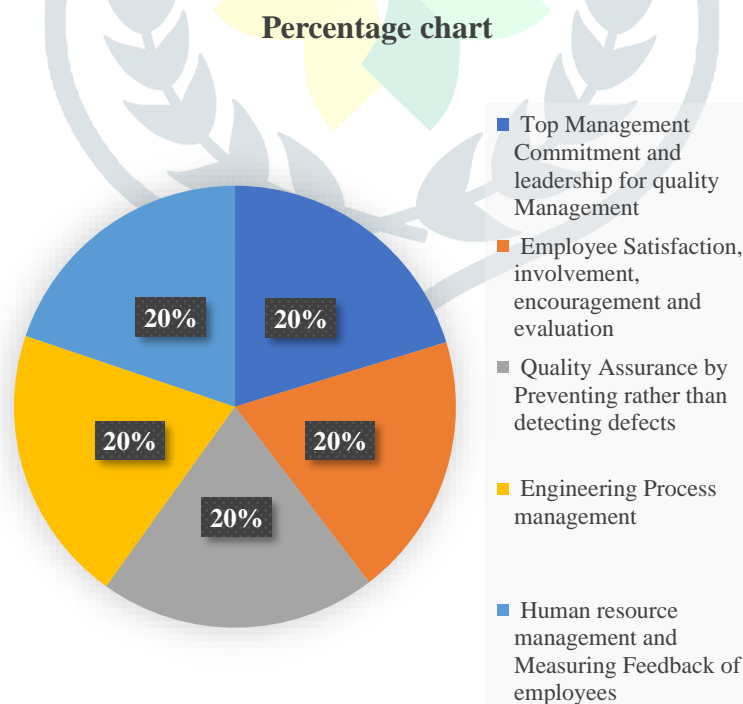

Fig. 2: Top Five CSF Importance in business

Table 2: Cronbach's alpha value of 5 CSF Reliability Statistics

Cronbach's Alpha	N of Items
.877	5

The Cronbach's alpha value (0.877) easily shows that the CSF is very reliable with each other. This 5 CSF is important to become success in any business.[8][5]

These shows that Top Management Commitment and leadership for quality Management / Employee Satisfaction (0.387) has weak correlation, involvement, encouragement and evaluation, (0.459) has moderate correlation in Quality Assurance by Preventing rather than detecting defects / Human resource management and Measuring Feedback of employees, Quality Assurance by Preventing rather than detecting defects / Employee Satisfaction (0.366) has weak correlation, involvement, encouragement and evaluation, Employee Satisfaction, involvement, encouragement and evaluation / Engineering Process management (0.488) has moderate correlation , Top Management Commitment and leadership for quality Management / Human resource management and Measuring Feedback of employees (0.713) has strong correlation, Engineering Process management / Human resource management and Measuring Feedback of employees (0.892) has strong correlation.[6],[8].

CONCLUSION

Here, Finding barriers by implementation of TQM in firms of the developing countries.

Barriers to Implementing Total Quality Management: In TQM, there is a scarcity of skills and resources**,** Employee commitment/understanding is lacking, There is a lack of education and training to drive the process of improvement, The priority is given to the schedule and the budget, The tendency to treat symptoms rather than the underlying cause of a problem, A lot of paperwork is required (lack of documentation), Inappropriate organizational structure, Lack of information system, Inability to adopt Complexity of process, Lack of knowledge about cost of quality, Poor communication.

The poor communication can build by the language or gestures. Small firms give priority mostly to short term capital. They are unable to complete sufficient documentation work due to a lack of staff. Small organization does not have far vision of success.

As the statistical data availability is not as required to analyse the organization on TQM principles also organizations didn't have TQM implemented as expected as a result, we decided to move our attention from CSF to barriers of implementation.

Engineering Process management / Human resource management and Measuring Feedback of employees (0.892) has strong correlation, Top Management Commitment and leadership for quality Management / Human resource management and Measuring Feedback of employees (0.713) has strong correlation. The future scope is to focus on moderate correlation and null hypothesis correlation in order to increase the organization's future success and raise public awareness of "TQM."

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