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# TOWARDS TOTAL QUALITY MANAGEMENT CONTROL (TQM) FOR CONSTRUCTION IN PAKISTAN

BY

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## ABSTRACT

Quality in construction projects has always been a problem in the country. Traditional approaches for quality control have proven inefficient due to which both human and material resources are wasted, giving rise to lower quality and productivity along with higher costs. Total quality concepts, which initially emerged in Japan, are now being implemented successfully in the manufacturing and service industries worldwide. Due to some dissimilar and unique characteristics of the construction industry as compared to manufacturing industry, TQM for construction industry has not yet been fully recognized, especially in Pakistan.

The paper discusses first total quality control concepts and then evolution of TQM from traditional quality approaches and finally the effectiveness of TQM application in construction. At the end, keeping in view local scenario, recommendations are made to move towards TQM, for construction, in the country. Unification of the traditional approaches including system/standards, with a quality culture of management & work force, and a better interaction among all parties involved in construction, can lead to an effective TQM. Higher values of quality, safety and productivity along with a lower overall cost will result through its implementation in construction industry.

## INTRODUCTION

The term total quality control (TQC) originated with the book by that name, written by A.V. Feighenbaum and firstly published in 1951. As firstly applied by Japanese in their manufacturing industry, it is also considered as Japanese approach to quality control. It is a detailed approach to quality and it relates to every facet of the business. It is the process of continuous improvement through attention to manufacturing detail rather than attainment of fixed quantitative quality standard (Adam 1992).

According to this approach the burden of quality proof rests not with inspection but on all the people involved in production and management. With this evolved in eighties a new concept known as Total Quality Management (TQM) --- a people focused management system, that aims at continued increase in customer satisfaction at continually lower real cost. TQ is a total system approach (not a separate area or program) and an integral part of high level strategy. It works horizontally across functions and departments, involving all employees, top to bottom and extends backward and forward to include the supply chain and the customer chain (Rampy and Roberts 1992).

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## THE EVOLUTION OF QUALITY APPROACHES

The management of quality has been as issue since long, and has developed through several major phases. There has been a revolutionary shift from traditional managerial practices and quality approaches to more of a strategic one, now generally referred as Total Quality Management, during last two decades. Approaches to quality have evolved through a series of gradual refinements over the last century. There have been four distinct eras of quality management or TQM (Garvin 1988). Table 1 provides an overview of these quality control strategies.

TQM philosophies advocate that all aspects of the company must be well managed and all employees well trained, with adequate authority to perform their jobs effectively.

The Japanese principle of "Kaizan" stresses that all employees should continually search for improvements, no matter how small, everywhere, everyday. (Imai 1986). TQM teaches a philosophy of defect prevention in which a broad interpretation of the term "defect" includes unsatisfactory performance in terms of product, information, or achievement of goals to internal customers, and external customers as well as management. TQM also includes a good feedback system so that problem areas can be quickly identified and improved.

The plan, Do, Study, Act (PSDA) cycle generally called "Deming cycle" provides manager, with a scientific method for learning how to make improvements (Deming 1986).

## QUALITY CONTROL IN THE CONSTRUCTION INDUSTRY

Quality control concepts have basically been derived from manufacturing quality control programs. But due to the following dissimilar characteristics of construction from manufacturing industry, these quality programs have been considered unsuitable/ineffective in construction industry.

1. Each construction project is unique in itself.
2. Each construction site is unique, having its own environment.
3. Long life cycle.
4. Subjective evaluation in the absence of clear, uniform evaluation standards.
5. Influence of the owner.
6. All parties in the project --- owner, designer, contractor, material supplier etc. --- differ for each product.

In a traditional quality control program for a construction project, quality assurance is done after completion; by owner, designer or building authority or a combination. Consequently correction is done for defects pointed out, if any. Such defects/corrections are generally not brought in t he knowledge of top management. In the absence of any feedback or information data bank, there is no chance of early identification of defects in future

projects. Therefore, no change may be brought in procedures, hence leading to low quality. Though construction management exists in the flow chart for the execution of construction plan but that lacks quality management.

## A MOVE FROM JUST QUALITY TO QUALITY IN CONSTRUCTION

To overcome the shortcomings in the traditional quality control, there has been a change of concept from "controlling quality" to "controlling management for quality" Under this concept of total quality control which integrates the quality development, quality maintenance and quality improvements of the various groups in an organization; policies are defined for quality, for the control of quality, and for management of the quality control system.

In a construction project, defects/failure can result from malfunction on the part of the designer or contractor. Hence the total quality management organization must have the ability to deal effectively with all parties involved.

Fig. 1 on the next page, shows a total quality control chart, for implementation in the construction industry, which has the following advantages over the traditional quality control/assurance program.

1. Derivation of a more uniform and comprehensive quality standard from data base maintained due to continuous feedback from previous projects.
2. All phases of the construction project; design, planning, execution and evaluation, are integrated through quality management organization.
3. Defects are identified & corrected at early stages.
4. Quality data base expands with continued feedback, hence defects identified in the past, are not repeated in future projects.

Figure 1. Total quality management Chart.

With a global vision of quality, ISO 9000 is a step towards identification and standardization of functions of quality management practices.

ISO 9000 standards only specify the management system requirement, but do not prescribe the procedures to accomplish. In order to achieve TQM, an organization must have both the methods and culture, necessary for quality (Bentley 1993).

Chase (1993) reported the following ten (10) common elements found in the TQM processes, being used by design and construction companies in the USA.

1. Upper management involvement, commitment and leadership.
2. Vision, mission, and guiding principles, developed in concert with the employees of the organization.
3. A significant amount of training in quality awareness, communication, leadership, teamwork, process improvement, and jobs related skills.
4. Improved communication.
5. Teamwork.
6. A focus on satisfying the customer.
7. A focus on improving the work environment, helping employees improve, and involving them in the improvement efforts of the organization.
8. The use of formalized process improvement techniques.
9. Helping supplier, and subcontractor improve; and
10. Striving for continuous improvement.

## CONCLUSIONS AND RECOMMENDATIONS

With the world squeezing into a global village, and acceptance of ISO 9000 as the best quality system, there is a dire need for bringing a change in attitude/culture, so that TQM may be effectively implemented for construction in the country. Like other industries, construction industry will have to adopt ISO 9000 standards based on quality management. Adoption of ISO 9000 mean building basic Quality System infrastructure i.e., consistency. A move towards TQM would be a second stage, which is a strive for Excellence.

Quality is the net result of a set of behaviors and system. But regretfully, quality seems not one of our social concerns. We want it when we are customers, but we do not exhibit it when we are a society. In such a situation we will have to work very hard for the creation of an iceland of quality within a very casual society.

In the light of above mentioned facts, the following recommendations are made, in order to move towards TQM, for construction in Pakistan.

1. ISO 9000 standards should be adopted for all phases of construction process.
2. There should be commitment from the top management to implement quality culture/environment. This is a key factor which requires time, budget and personal involvement on their part.

3. There should be an attitude/culture change. Positive attitude, teamwork, participation, communication, professionalism, interpersonal, relationships, and commitment are some of the key words, to work on, and relate to everyone in the organization. It is a long term process and one should not expect overnight changes.
4. Extensive training and education at all levels is essentially required. This will also help in attitude change.
5. Better work place environment and recognition of one's performance should be implemented.

Lastly, the understanding of Total Quality Management principle is so important for the country's future, that this should be included in the curricula of colleges and universities, especially in the courses of Civil Engineering program of studies. In this way those graduates would be ready to apply the principles of quality management from the first day they are on the job.

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## APPENDIX

TABLE 1. Stage of Quality Movement.

| Identifying Characteristics | Inspection (1800's) | Statistical Quality Control (1930's) | Quality Assurance (1950's) | Strategic Quality Management (TQM) (Present) |
|---|---|---|---|---|
| Primary Concern | Detection problem | Process Control | Co-ordination and Prevention | Strategic Impact |
| Perception of Quality | A problem to be solved | A problem to be solved | A problem to be solved and prevented to happen again | A competitive opportunity |
| Emphasis | Uniformity | Uniformity with less inspection | Preventing quality failure | Customer's Satisfaction |
| Techniques | Inspection Sorting & Grading | Statistical tools & methods | System & Procedures | Planning Participation |
| Who is responsible for quality | The Inspection Department | Manufacturing & methods | Every one in the organization | Everyone in the organization |
| Orientation and Approach | "Inspects in quality" | "Control in quality" | "Builds in Quality" | "Manages in Quality" |