

Total Quality Management in Research and Development Sections of Different Sectors: A Social Responsibility

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Abstract:- Total Quality Management is the is a dynamic, multi-dimensional concept that refers not only to the mission and goals of an organization, but also works to fulfil the specific standards of the system, facility, program or event. The pedagogical theory and practice is to determine what the quality of an organization is. In this paper the TQM in Research and Development of MNCs, Defence Organizations and Educational Institutions have been analyzed. The analysis is based on social responsibility of each sector towards the well being of the society

Keywords: Responsibility, Quality, Implement

1. INTRODUCTION

TQM is an integrated organisational approach in delighting customers (both internal and external) by meeting their expectations on a continuous basis through everyone involved with the Organisation working on continuous improvement in all products / processes along with a proper problem solving methodology. The TQM philosophy evolved from the continuous improvement philosophy with a focus on quality as the main dimension of business. Under TQM, emphasizing the quality of the product or service predominates(2). TQM expands beyond statistical process control to embrace a wider scope of management activities of how we manage people and organizations by focusing on the entire process, not just simple measurements.

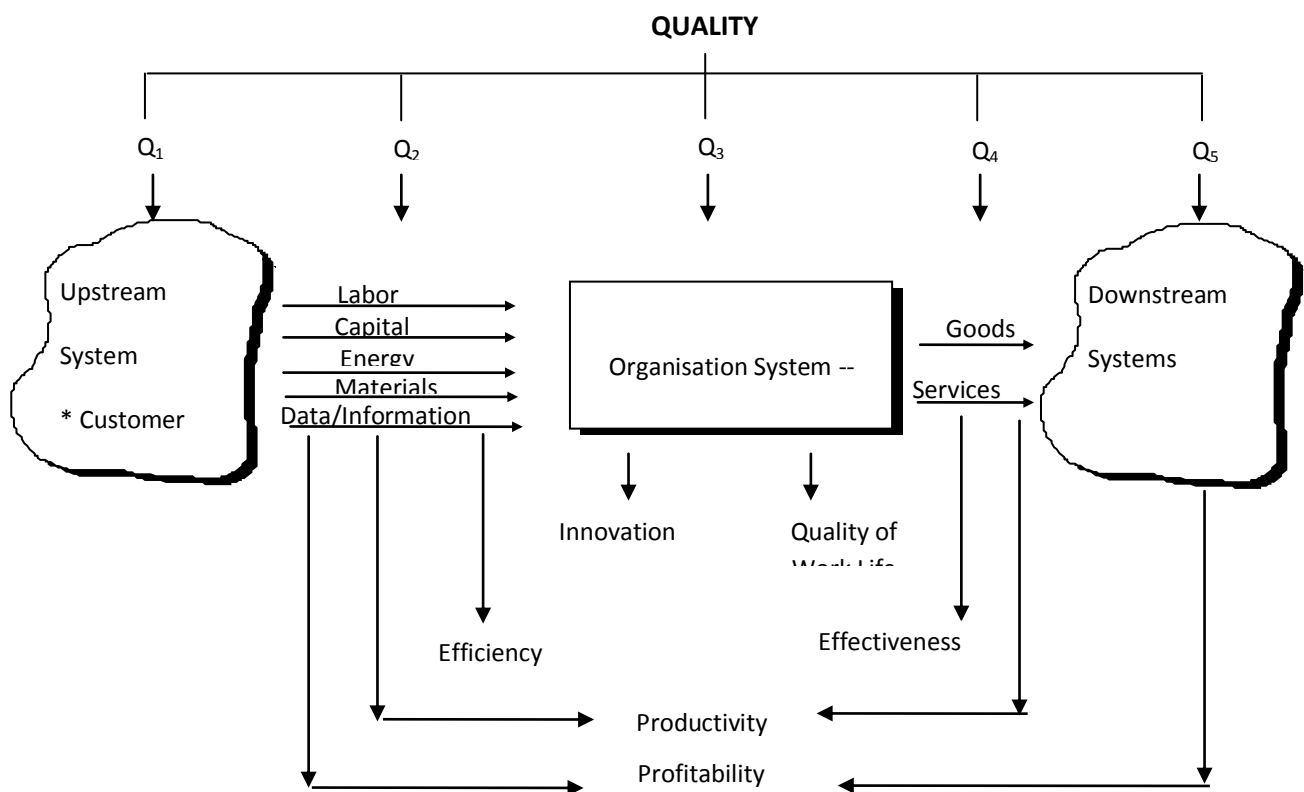


Fig. 1.1 - Organizational Quality model

TQM is a comprehensive manage

- ◆ Focuses on meeting owners'/customers' needs by providing quality services at a cost that provides value to the owners/customers
- ◆ Is driven by the quest for continuous improvement in all operations
- ◆ Recognizes that everyone in the organization has owners/customers who are either internal or external

- ◆ Views an organization as an internal system with a common aim rather than as individual departments acting to maximize their own performances
- ◆ Focuses on the way tasks are accomplished rather than simply what tasks are accomplished
- ◆ Emphasizes teamwork and a high level of participation by all employees

TQM beliefs

Presented here are universal total quality management beliefs (1).

- ◆ Owner/customer satisfaction is the measure of quality
- ◆ Everyone has owners/customers; everyone is an owner/customer
- ◆ Quality improvement must be continuous
- ◆ Analyzing the processes used to create products and services is key to quality improvement
- ◆ Measurement, a skilled use of analytical tools, and employee involvement are critical sources of quality improvement ideas and innovations
- ◆ Sustained total quality management is not possible without active, visible, consistent, and enabling leadership by managers at all levels
- ◆ If we do not continuously improve the quality of products and services that we provide our owners/customers, someone else will

2. OBJECTIVES OF TQM IN RESEARCH & DEVELOPMENT LAB

It seems that the introduction of QM in R&D by law or, more generally, by external pressure, will strengthen the reservations against QM in industries. It is argued that the rigidity of existing, often too formal, QM systems and an excessively normative approach restricts scientific freedom and can be a serious setback to scientific progress, discouraging creativity in research and increasing bureaucracy, sometimes without reaching its goal (real better method or true analytical result). Apart from legal preconditions, there are other reasons for a TQM system in R&D (3). These reasons are further diversified on the basis of type of organization:

2.1 For R & D Labs in Multinationals

- To develop products of superior quality in the minimum possible time and at optimum cost
- To develop and maintain a technological edge over competitors
- To create and maintain a base for further technological improvements including infrastructure, human resources, etc.
- To enable quick productionisation of products developed
- To ensure easy usability and maintainability of products
- To support up gradation of products already developed
- To ensure quality and reliability of products

2.2 For Defence R & D labs additional considerations would be

- To ensure maximum indigenisation of products developed or evolve a strategy for indigenisation at a later date.
- To develop technologies which are denied to the country under various technology denial regimes.

2.3 For TQM in R & D of Academic Institutions:

The concept of TQM is applicable to academics. Many educators believe that the Deming's concept of TQM provides guiding principles for needed educational reform. In his article, "The Quality Revolution in Education," John Jay Bonstingl outlines the TQM principles he believes are most salient to education reform (5). He calls them the "Four Pillars of Total Quality Management."

- Synergistic Relationships: involvement of both customer & supplier, i.e. teacher student involvement.
- Continuous Improvement and Self Evaluation
- A System of Ongoing Process
- Leadership, i.e., good top management

3. ORGANISATION FOR TQM

Successful Management of the R&D function in any organisation requires a system to support it. The support systems for R&D activities differ depending on the nature of the organisation and the scale of its R&D activities. The basic elements of this support system normally cover the following :

- ✓ Strategic Planning
- ✓ Resource Planning and Deployment
- ✓ Communication (Internal and External)
- ✓ Project Planning and Execution
- ✓ Research & Development (R&d)
- ✓ Finance and Accounting
- ✓ Quality and Reliability Management
- ✓ Value Engineering

However for large organisations, the support system is organised at two levels, i.e., the Headquarters and Laboratories.

ORGANISATION AT HEAD QUARTERS

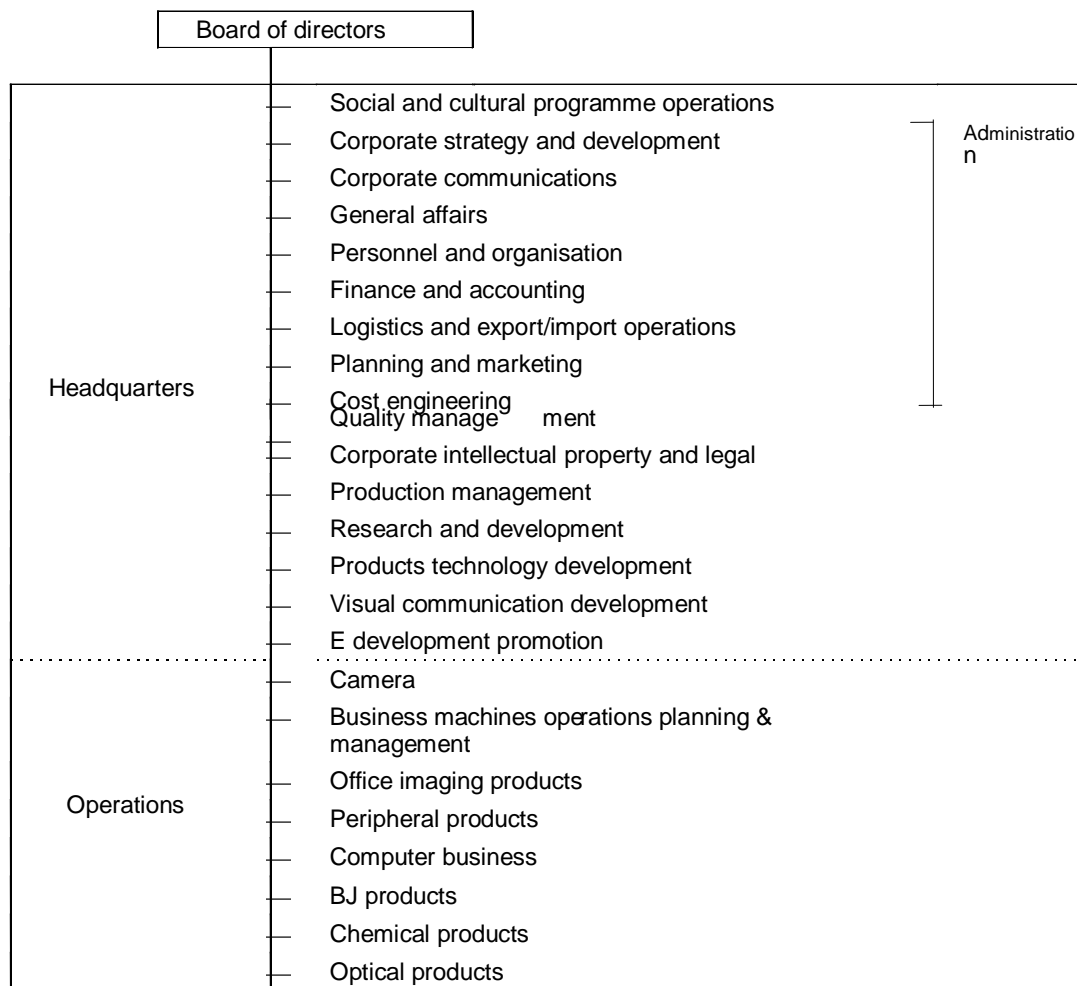
- ✓ Corporate strategic planning
- ✓ Corporate communications internal & external)
- ✓ Resource planning and deployment
- ✓ Finance & accounting
- ✓ Value engineering
- ✓ Quality & reliability management
- ✓ Research and development

ORGANISATION AT LABORATORY

- ✓ Project planning & execution
- ✓ Research & development
- ✓ Resource planning and deployment
- ✓ Finance and accounting
- ✓ Value engineering
- ✓ Quality & reliability management

This can well be understood by considering the R & D Organization of a multinational XYZ Ltd.

Case -1: R&D Organization at XYZ Ltd



The Head Quarters consists of 16 parts of which the last 4 deal with R & D.

XYZ's R & D System

	Headquarters	Operations
Functions	Mid term strategy planning Long term strategy planning Business group support Functional technology development Key technology development Business preparations R & D term : 1 - 10 years	Business planning Product orientated technology development Product design R & D term : 1 – 3 years

Apart from having a system to co-ordinate R&D activity within the organization, there should also be a system for interfacing with other organizations. This system should however be within the frame work of the policies set by the head quarters. Some of the important classes of organizations are :

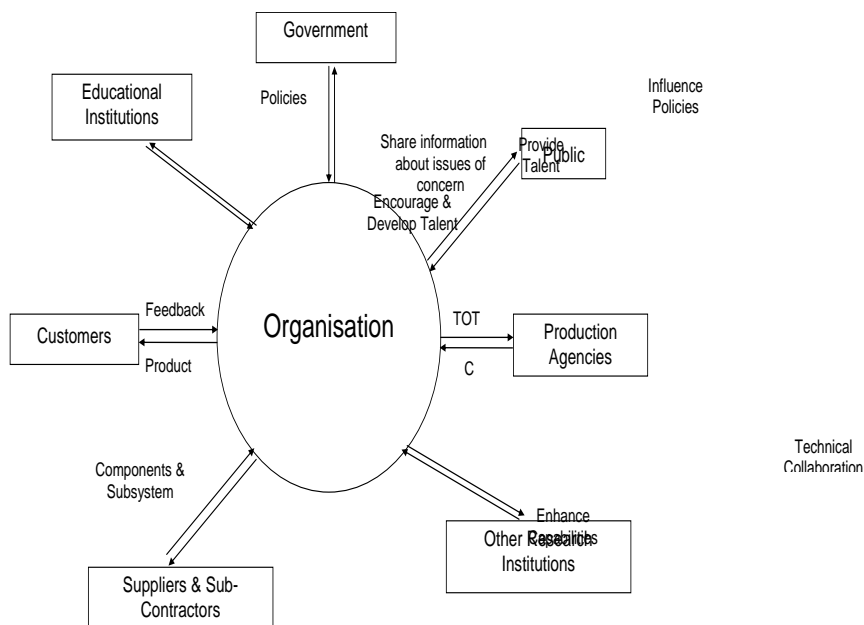


Fig.2.1 - Interface with External Organizations

4. MANAGEMENT SYSTEMS FOR R & D

During the last few years there has been ever increasing interest in the development of a more general strategy for applying QM systems in research and development activities in research laboratories or institutions. The driving force behind these activities has been the need for conformity with international quality standards given by ISO and others and also by the accreditation and certification bodies.

- System for technology identification and development
- System for project (product) identification and selection
- System for information management
- System for managing interfaces with collaborating organisations
- System for project management and execution
- System for strategic planning
- System for quality and reliability
- System for customer relations management
- System for continuous development of human resources

5. SYSTEM FOR TECHNOLOGY IDENTIFICATION AND DEVELOPMENT

Due to some academic misinterpretations (e.g. cold fusion) or even fraud in highly respected institutions in recent years, society has become more and more doubtful of the so-called “exact and objective” natural science disciplines. One result of intensive competition for external funding is the manipulation of experimental data to achieve the desired results in order to appear successful (4). As Technologists we should strive to set up TQM principles which will enable us to establish TQM in all fields of R&D. A generic system can be represented as follows:

- Creating an environment for generation of creative ideas
- Criteria for selecting the most promising ideas
- Providing support in the form of money, human resources, capital infrastructure, etc., for development of the ideas into products.
- Criteria for allocation of these resources among the projects (ideas selected) including priorities
- Systems for periodic review, monitoring and evaluation of the progress of these projects
- Recognition of the successful projects teams

6. IMPLEMENTING TQM in R & D

Quality in research and development (R&D) has become increasingly important as companies commit themselves to quality improvement programmes in all areas of their activity. Quality improvement forms an important part of their competitive strategy. Quality management systems have been successfully designed and implemented for manufacturing and service functions; but so far the quality principles and systems have been difficult to translate to the R&D function. Implementation can be carried out based on the following guidelines:

- Identify the systems to be strengthened.
- Prioritise the tasks
- Develop an implementation plan.
- Implement the plan.
- Monitor and evaluate the implementation.
- Take action to keep implementation focussed

7. CHARACTERISTICS OF SUCCESSFUL TQM COMPANIES

Lets consider the example of construction companies who are quite new members of TQM philosophy, probably due to the tendency to easily brush aside anything in management that is new, or to dismiss TQM as a fad.

Continuous improvement is not a fad but a necessary part of management’s obligation to properly run its company.

Gone are the boom days when quality did not matter due to the volume of work available and the ease of obtaining work.

The attitude of construction managers and contractors was simply to add it to the bill, because the owner will pay for it.

In other words, in those boom days **Cost plus Profit equalled Price**. Now, however, the new attitude is **Price minus Cost equals Profit**. Owners are now demanding higher quality work, and at a lower cost. In attempting to keep pace with the new attitude, a quality management system that helps keep costs down is well worth implementing.

- The characteristics that are common to companies that successfully implement TQM in their daily operations are listed here.
- Strive for owner/customer satisfaction and employee satisfaction
- Strive for accident-free jobsites
- Recognize that the owner/customer provides the revenue while the employees are responsible for the profit
- Recognize the need for measurement and fact-based decision making
- Arrange for employees to become involved in helping the company improve
- Train extensively
- Work hard at improving communication inside and outside the company
- Use teams of employees to improve processes

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- Place a strong emphasis on the right kind of leadership, and provide supervisors with a significant amount of leadership training
 - Involve subcontractors and suppliers, requiring them to adopt TQM
 - Strive for continuous improvement

In fact the responsibility of making any system successful lies on both the supplier and the consumer in all sectors of industry and they should work together to bring about a change for the betterment of the society.

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