1. QUALITY CONCEPT TO TQM PHILOSOPHY

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Abstract

Education today is in search of quality. The concept of quality is known to us in a traditional way. But during the last 50 years, the industrial revolution accompanied by mass production has impelled us to preceive quality in totally a new way. The concepts of quality, quality by inspection, quality assurance and total quality have come up.

Industry has been compelled to go in for quality and excellence due to global market, open economy and privatization. It is now the turn of Engineering Education to follow in the footsteps of Industry. Hence, the need for those involved in Education, particularly in Higher and Technical Education, to understand quality and adopt / adapt it.

Hence, an effort has been made in this article to deliberate three aspects namely (i) the quality movement (jj) the quality concept and (iii) Educational perception of quality. Then the philosophy of TQM & its six basic principals are explained.

The Quality Movement

1.1 Introduction :

Quality is at the top of most agendas, be it an educational institute or a business enterprise and improving Quality is probably the most difficult task facing an institute or an enterprise. Yet, many people find quality an enigmatic concept, perplexing to define and difficult to measure. In our daily life, we usually take quality for granted, specially when it is regularly provided, we acutely become aware when it is lacking or absent.

Quality has become a buzzword with everyone. It is on every ones lips. It is not a fad nor a mere initiative for which one takes fancy for some time and discards it very soon. Quality has become an obsession and many developed countries have taken concrete steps to promote Quality by instituting National Awards and Charters in their respective countries during the last decade.

In U.K., we have Citizens Charter and the Investors in Public standards, while in U.S.A. it is the Malcolm Baldridge Award. In Europe, they have European Quality Award, while on the international scenario, we have ISO 9000. Many of the Industrial houses, Manufacturers and Service Industries have already gone in for ISO 9000 certification. Quality concept is now knocking at the gates of Educational Institutions and, now, it is their turn to demonstrate publicly that they can deliver quality services consistently.

1.2 How Quality Originated :

To look to the origins of quality, we have to go to industry where the quality came up as movement. There has always been a need to ensure that products confirm to the

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specifications and give consumer satisfaction and value for the money he spends for it. A consumer will develop confidence about a product and its manufacturers only if they can produce goods with quality, consistently, over a period of time.

Before the advent of industrialization and mass production, quality was the concern of an individual craftsman, be a carpenter, a Goldsmith, a silver smith who set and maintained their own standards on which their reputation and livelihood depended. With the advent of industrialization and mass production came the breaking down of a job work into narrow repetitive tasks, which took away from the worker the possibility of self – checking for quality. The responsibility for quality no more rested with a single individual.

In a factory today, the job passes through different hands in different shops and quality does not remain the concern of any single individual. This situation created the necessity of quality inspection and quality control. The idea of quality control through inspections and discarding substandard jobs, came up. These are necessary processes under mass production but they are often wasteful and expensive, involving considerable amount of scrap and reworking. Quality inspection were seen an un – economic. Concepts of Quality Assurance and continuous Quality Improvement that seek to build quality into production came up and the responsibility for quality was again delegated to the worker. Table 1 depicts chronological developments of quality.

Table 1: THE CHRONOLOGY OF QUALITY DEVELOPMENT

Pre – 1900	Quality as an integral characteristic of craftsman
1900-1920	Quality control by foreman
1920-1940	Inspection – based quality control
1940-1960	Statistical process control
1960-1980	Quality assurance / total quality control (the quality department)
1980-1990	Total Quality Management
1990-	TQM, the culture of continuous improvement, organization wide quality management.

1.3 The Quality Gurus :

One of the most influencial management theoretician was Edward Deming, an American statistician, born in 1900. Deming began formulating his theories as he worked on methods of removing variability and waste from industrial processes. Later on, Mayo and his team recognized the importance of the formal structures within the organization to industrial output and productivity and their impact on working practices. Walter Shewhart, another statistician, developed techniques to bring industrial processes, under what he called "statistical control". These are series of techniques for removing the sources of variability from industrial processes so that these become more predictable and controllable. The statistical process control combined with the insights of the human relations movement associated with Mayo and his team, are today the basis of Total Quality Management.

1.4 Quality and Education :

There has been traditional reluctance on the part of education to adopt industrial management methodologies and language. This is the reason why the quality movement had a late entry into the educational field. Educationalists dislike the anology between educational process involving human beings and the manufacturing of industrial products involving inert material. However, growing willingness by educationalists in the west, has been noticed since 1990 and willingness to explore lessons from industry as well as efforts and initiative for Industry Institutions Partnership have made

industrial concepts of managements more and more acceptable to education and the earlier resistance seems to be waning.

1.5 Increasing Interest in Quality :

In 1950-1960 period, immediately after Second World War. American Industry had a sellers market for the world, hungry for manufactured goods. The aims and objects of the industry was to maximize the output and profit. In a sellers market, quality has low priority. When in late 1970s, USA lost the automobile and other market and market share to the Japanese; they began to take quality seriously. They started thinking why consumers in USA preferred Japanese products. The turning point came in 1980, with a nationwide NBC documentary, called "If Japan can, why cannot We". This documentary highlighted the dominance of Japanese goods in the U.S. market. This documentary further presents Deming and his contribution to Japanese economic success. Since then, the message of Deming and Juran together with other experts like Philips Crosby and Armand Feigenblum caught the imagination of industries and business houses both in USA and Europe. This resulted in their obsession with quality with a view to displace Japanese from their home market. Still only a few companies had gone in for TQM by this time.

1.6 The TQM:

The quest for answer to Japanese competition was presented in "In search of Excellence" by Peters and Waterman around 1980 or so. They analyzed essential features of the "Excellent" company based on the best practice then existing in US. They concluded that: -

1. Companies that have excellent relationship with their customers are often most competitive and profitable.

2. Excellence goes hand in hand with simple but crucial notions, of being close to the customers and an obsession with Quality.

3. Excellent organizations have simple non-bureaucratic structure based on active and enthusiatic teams.

These features that Japanese had embraced are the key to their success. This in short, is the basis of the TQM which comprehends Quality in totality. It is time, now, for Educationists to study relevance of Industrial Management Methods to education, adapt / adopt them for educational institutes and demonstrate publicly that what is good for Industry is equally good ad relevant to education. Education has to consider ISO 9000 standards; Accreditation process initiated by AICTE and the Total Quality Management approach and study their fitness and relevance for education; be it at school, college or university level. It is a challenging job indeed. Industry, which has already gone in for Quality, now demands Technical manpower with Quality education. It is for Engineering Education to accept this challenge as it enters the 21st century.

2. The Concept of Quality

2.1 Introduction :

Quality is a "slippery" term, meaning different things to different people. It is a dynamic idea. It has emotional and dynamic force, which makes it difficult to define and all the more difficult to measure. In spite of all this, attempts must be made to understand what quality is and what it means.

2.2. Absolute and Relative Notions of quality:

In our conversation, we use the term quality in the absolute sense. As an absolute quality, it is similar in nature to goodness, truth and beauty. It is an ideal with which there can be no compromise. It is considered as a part of the thing itself. Quality cannot be ascribed nor imparted to a thing. It has to be integral part of a thing. To cite an example, it is the Taj Mahal, the furniture in the Ashoka Hall of the Rashtrapati Bhavan, the Kohinoor Diamond etc. These are

the things of highest quality standard which cannot be surpassed. These are things of perfection made with no concern for money and labour involved. They are most invaluable and bring pride and prestige to the owner. They impart status and the ownership of such quality objects and set their owners apart from those who cannot afford these. Most of us admire it, many of us want it and few can have it. It is an elitest – concept. This absolute concept of quality is not relevant to education. The only lesson to be learnt or inference to be drawn from this absolute concept of Quality is to promote ideas of Quality. It tells us that perusing Quality is all about performing to the highest standard.

2.3 Quality – A Relative Notion :

Here, Quality is viewed not as an attribute of a product or service but as something, which can be ascribed to it. Quality, in this sense is measuring against a norm, standard or specification. Quality products in the relative sense need not be expensive nor exclusive. They may be beautiful but not necessarily so. They do not need to be special; they can be ordinary, commonplace and familiar objects. This relative notion is potentially egalitarian whereas an absolute notion of quality is elitist. What allows the quality label and degree of quality level to be associated with any product and service is that it meets the norms / standards set for it. It must do what is claimed for it and do what customers expect of it. In other words, Quality here can be defined as "Fitness for the purpose" as defined by the British standard and Quality Gurus.

2.4 Two Aspects of Relative Quality :

In the relative sense, quality is about measuring to a predetermined standard and meeting these standards, time and again i.e. consistently, over a period of time. This relative definition of Quality has two aspects. i) Procedural ii) transformational. The procedural

Table 2 : shows comparison between absolute and relative quality.

	QUALITY ABSOLUTE (Goodness, Beauty and Truth)	QUALITY RELATIVE (Things that satisfy the needs / wants)
1.	Quality is an integral part	Quality can be ascribed / imparted
2.	Things of highest possible standard standard, un-surpassable.	It is measured against prescribed norms / standard
3.	Things of perfection, no expenses spared.	An ordinary, common, place thing; need not be expensive
4.	A proud possession, imparts status & prestige.	A possession that meets the needs & wants. May be beautiful, but not necessarily.
5.	Elitist notion	Egalitarian notion.
6.	Most admire it, Many want it, Few can have it.	It must do what is claimed for it and do what is expected of it; fitness for purpose.
7.	Few can offer, Most cannot afford. Institutions cannot aspire to provide	Many can offer, provided, they study, the needs / wants and provide the required quality consistently.
8.	Persuing quality by performing to the highest standard	It is measuring to a standard, meeting the needs and wants of customers.

aspect is concerned with "measuring up" against predetermined norms / standards. The question to be asked is "Does this product / service do, what is expected of it ?" "Is it fit for the purpose or use intended." This, Edward Sallis calls as "Producer definition" or "procedural concept" of quality. In the industrial context, it can be said that, a manufacturer / producer achieves the quality of his product by meeting pre-determined norms / specifications in a consistent fashion. The producer demonstrates this quality aspect by a system – known as Quality Assurance System." A product exhibits quality so long as it consistently meets the norms, the makers claim for it. This may be described as "Quality in fact". It is the basis of the quality assurance system associated with ISO 9000 and other quality standards.

The procedural concept lays emphasis on working to defined systems and procedures most likely to produce a standard quality item. Quality can be achieved by putting systems and procedures into operations and ensuring that these systems and procedures are in a way PROVING that predetermined norms / specifications are being achieved by following appropriate systems and procedures. It ensures conformance to requirements. For example, in the educational field, examination results are taken as performance indicators.

The second concept, which Edward Sallis prefers to call **"The transformational"** concept of quality, is less concerned with systems and procedures and more with organizational transformation. It is based on the need for the organization to be "customer focused" rather than "product focused" The transformational concept views quality as complex process which while it can embrace the narrower instrumental definition of quality, has a wider canvas. In addition to embracing the measurable aspects of quality (i.e. conforming to specifications etc.) it also seeks to integrate softer and more intangible aspects of quality. These may include care for customers, customer service and social responsibility. These go to the heart of the difficult and intangible aspects of customer satisfaction. These are the aspects, which bring the customer back, time and again, and hold their allegiance.

Transformational quality is achieved not through systems and procedures, but through establishing customer requirements and then building organizational structures, which empower employees and workers to meet them. Whereas the procedural concept is about proving, the transformational approach is about IMPROVING. It is about "doing things right" not just "doing right things". It is a state of organizational mind that sees continuous improvement as the key to quality process. It is concerned with blending the aspirations of customers with the empowerment of the workers. It concentrates on "excellence" and not just on "fitness of purpose". It puts customers first and then seeks to expand his horizons. In an educational setting, the transformational culture is a function of the staff, motivation and academic leadership in a setting that is student centered. Both the concepts, procedural and transformational of quality, play a key role in understanding quality. The persuit of quality is not merely an exercise in appropriate systems and procedures but also a customer oriented transformational culture where individuals are given the responsibility for the quality of work in their areas and they contribute fully to its achievements. This aspect assumes great significance in service industry. Here, the softer indicators – care and concern – play a predominant role in not merely satisfying the customers but in delighting them.

2.4 Quality Control, Quality Assurance and Total Quality :

These terms are frequently used in connection with quality. Hence, it is very necessary that we understand their meaning and distinction between these.

a) Quality Control :

It involves detection and rejection of final

components / products which are found to be sub-standard. It is an event, after the process. This, no doubt, ensures quality of product supplied but involves considerable amount of waste, scrap and re-working. Quality control is usually carried out by Quality Inspectors or Quality Controllers.

b) Quality Assurance :

In this, the aim is to prevent faults. It is before and during the process. Quality is designed into the processes to ensure that the product is according to the required specification. Simply stated, quality assurance is a method for producing defect free/fault free product. In the words of Philips Crosby, the aim is "Zero defect". Quality assurance is about consistently meeting product specification or **"getting things right first time, every time".** Quality assurance is the responsibility of the entire workforce. The quality of the product is assured by quality assurance system, which lays down exactly how production should take place and to what standards. Fig.1 shows hierarchy of quality concepts.
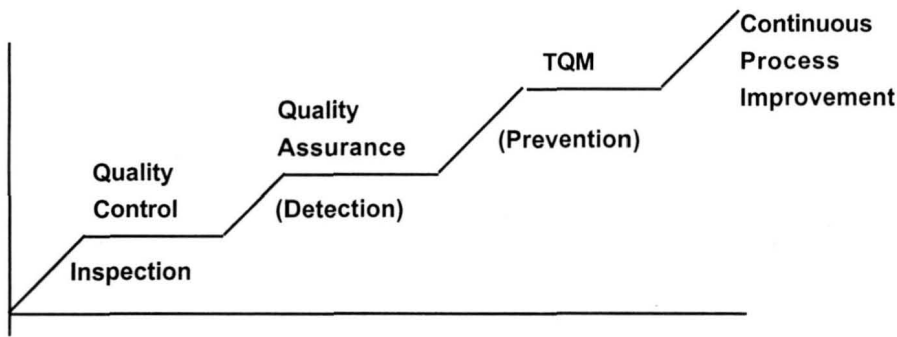

Fig. 1 : HIERARCHY OF QUALITY CONCEPTS

c) Total Quality Management :

Total quality management incorporate quality assurance and extends and develops it further. Total quality management is about creating a quality culture where the aim of every member of the organization is to delight their customers, and where the internal structure of the organization allows them to do so. It is about providing the customer with what they want, when they want and how they want it. It involves moving with the changing customer expectation and to design products and services that meet and exceed their expectations. It is only by delighting the customers that they will return to the manufacturer again and again and become almost regular customers., This can be done by continuous improvement. So continuous improvement is a predominant factor associated with total quality management.

Fig 2 : depicts concept of TQM based on two aspects of relative quality. (see fig. 2 on page no. 8)

TQM = Not merely systems and procedures, but also Quality Culture where every individual is given the responsibility of quality of work.

TQM = QA + Q Culture where the aim of everyone is to delight the customer. It is providing the customer with

What they want,

When they want,

Where they want, &

How they want.

3. Educational Preception of Quality

3.1 Introduction :

We have noted that the concept of absolute quality is not relevant to education but can only help us to understand that perusing Quality is perusing to the highest standard. Next, we shall try to understand Educational Quality in terms of relative notion of quality. For this, we shall pose a few questions. Is education a product? Is it a service? Who are its customers? and then try to explore the application of Quality, QA and TQM to educational activity.

3.2 Is Education A Product or A service?

Q, QC, QA are the terms associated with production in industry. Are these relevant and can these be applied to education?

Is student the product of education? Terms like "Supply of engineering graduates to Industry", sound like a production line where raw students are the raw material, education is the process which converts the raw students into an engineering graduate as the product / output. Can a student be treated as an inert material and education as a process, a student has to go through. In industry, a producer specifies and controls the source of supply. This raw material is subjected to systems and processes so that the output / product meets the predetermined specifications. Such a model does not fit into education. In education, the source of supply i.e. incoming students need to have prescribed qualifications i.e. XII standard pass, but amongst them there is great variation. These are to undergo educational process, which has to be controlled in the same way, as is done in manufacturing process in industry. Can the product of education be a uniform standard as that of an industry? It is said and rightly so that, "Human Beings are notoriously non-standard" and they bring into educational situations, a wide range of experiences, emotions and opinions, which cannot be ignored in the educational processes. The idea of a learner as a product messes the complexities of the teaching – learning process and the uniqueness of each individual learner. Hence, it is difficult to view education as a Manufacturing industry, and hence may be, it can be considered as a "Service" Industry. If so, the distinction between a product and service will have to be made, before we consider education as a service rather than a product industry.

3.3 Service Quality

Characteristics :

Quality aspects of products can be easily defined by way of specifications, norms and standards. But quality aspects of service provided are difficult to state, because they are mostly subjective. The cause of poor quality of a product and that of poor quality of service are different. Poor quality of a product may be attributed to faults in raw material and components' faulty design. But quality of service is due to employee behavior and attitude; lack of care and courtesy; indifference, lack of training and concern. When educational quality is concerned, these aspects will have to be borne in mind. Major differences between delivering service and delivering products are:

i) **Direct contact**: Service involves direct contact between provider and the end user. The service cannot be separated from the person who delivers it nor from the person who is being served. Every interaction is different and the quality of interaction is determined by the customer. The consistency of service can be only within certain limits.

ii) **Time:** Service has to be delivered on time and is consumed by the customer at the moment of delivery; hence the control of quality by inspection is too late. There is ample opportunity in service for feedback and evaluation to make a judgement on the quality of service provided.
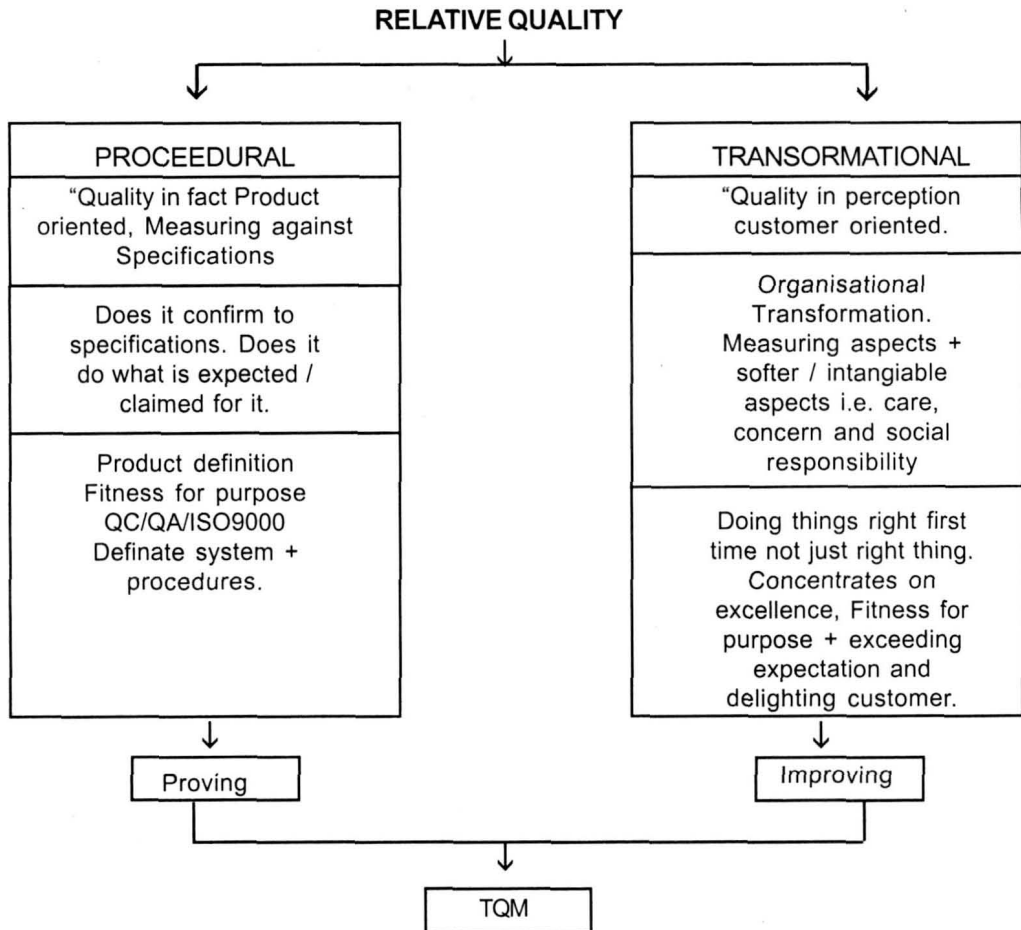
iii) **Service cannot be mended nor**

RELATIVE QUALITY

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                    PROCEEDURAL                              TRANSORMATIONAL
        "Quality in fact Product                    "Quality in perception
        oriented, Measuring against                 customer oriented.
        Specifications

        Does it confirm to                          Organisational
        specifications. Does it                     Transformation.
        do what is expected /                       Measuring aspects +
        claimed for it.                             softer / intangiable
                                                    aspects i.e. care,
        Product definition                          concern and social
        Fitness for purpose                         responsibility
        QC/QA/ISO9000
        Definate system +                           Doing things right first
        procedures.                                 time not just right thing.
                                                    Concentrates on
                                                    excellence, Fitness for
                                                    purpose + exceeding
                                                    expectation and
                                                    delighting customer.

              Proving                                    Improving

                              TQM
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Fig. 2 : Depicts concept of TQM based on two aspects of relative quality

replaced, nor repaired. A poor meal is a poor meal, it cannot be improved. Hence, standard for service should be right first time and every time.

iv) **Services are offered by Junior Employees**: Senior staffs are often remote from the customers. Hence, training of these junior employees and their understanding of the significance of their job is very important, but generally this aspect is not much taken care of.

v) **Services are difficult to measure.** Services offered are intangible, cannot be measured. Customer satisfaction in terms of facial expression, verbal expression are the only indicators. Hence, self-indicators — care, courtesy, concern, friendliness and helpfulness are upper most in the minds of the customer and hence the providers of services should be well aware of these aspects and must be capable of doing the needful.

3.5 *Customers of education:*

Students are the direct beneficiaries of education. They undergo the process of education and training and get value added to

them in terms of added knowledge, acquired skills, developed attitudes relevant to their occupation/ profession. On account of this, their services are sought after by the employers Govt. Industries and business houses. That is why parents spend for the education of their wards. Thus, if the value added is the product of educational process, the students can be considered as the primary customers. The parents, who pay for the students and the employers who utilize their services can be considered as secondary customers. The faculty and instructional staff in an Institution can be considered as internal customers.

If satisfaction of the needs/ wants of customers is to be the aim of an educational enterprise, it is these customers on whom all their activities should be focused. Now, having discussed various aspects of quality and their ramifications, it will be worthwhile to think how quality of education can be explained and if possible defined. Once this is done, we shall be in a position to explore how quality can be built up and improved in educational institutes. We are now in a position to undertake what may be called a Quality Mission under which programs can be drawn up for induction / improvement of Quality in our Educational Institutes.

The existing Q.A. agencies like ISO 9000 and accreditation of programs by NBA set up by AICTE along with the new Philosophy TQM or Total Quality Education, will have to be seriously explored, and decide which of these will fit in with the educational ethos and environment.

4.0   What is TQM ?

Total Quality Management is a style of management associated with Industry or an enterprise. It involves concepts of control, quality, process and customer. The Total Quality Phrase comes from "Total Quality Control "originally coined by Feigenbaum (1983) one of the quality gurus. The words "Control"

and management smack of centralization and authoritarianism, which is at the outset unpalatable to an educational environment. But it may be mentioned that Total Quality Control refers not to managerial decision making but to statistical control (Shewert, 1931) and the need to develop processes that are stable and predictable. It is controlled personnel/ management that is associated with Total Quality Management. As such, there is no reason why Total Quality Management should be looked at with aversion by educationists. As a matter of fact, Total Quality Management requires the hierarchical structure of a corporate body to be pulled down to a flat structure, which is consistent with taste and culture of an educational campus.

4.1   Before introducing TQM, it is better we know some terms pertaining to TQM

(a) Three Dimensions of Product:

Quality is associated with a product / service in industry. The characteristics of the quality of a product could be stated as its availability, it works, it is durable, service is good and employee is courteous. The quality of a product has three dimensions – design, process and output.

Design refers to the intended characteristics of a product. It should reflect consumers needs, should include prescribed specifications of the output, time frame for delivery and the supplies material and human resources – needed to develop the output.

Process – the flow of work activities is the most critical dimension of quality. The process should have identified the customer for whom the product is being processed who should also be involved in the design. "Customer first" is the motto of Total Quality Management. Plotting the process flowchart identifies various stages of design, processing and output. If there is a change in product / process, adequate attention is paid to design and output but the process part is almost not taken care of. A Process at

a particular stage may not be efficient / effective and rework will have to be resorted to: Components / product may have to be discarded being faulty / defective, resulting in scrap: processes may include steps that do not add to the value / quality of the product and there-by cause unnecessary complications.

A major object of Total Quality Management is to eliminated scrap, rework and unnecessary, avoidable complexity. Output refers to the actual product / service the customer receives. Structure,strength,shape and durability are the aspects of a product that are measurable, whereas a process is something which cannot be measured quantitatively.

Thus, it is seen that the most important aspect of production is the process and hence Total Quality Management aims to make the process controllable and predictable by using statistical control methodologies and initiating the idea of continuous improvement which is a distinctive characteristics of Total Quality Management over other styles of Managements.

(b) Continuous Process Improvement:

Total Quality Management is not a passive descriptive term: it is an energetic activity – that of Continuous process improvement. (C.P.I.) C.P.I. is the most important element of Total Quality Management Philosophy. Hence, it is necessary that we understand the concept of C.P.I. before we discuss TQM. There are four key ingredients for continuous process improvement. These are i) honesty ii) Shared vision iii) Patience iv) Commitment. The Total Quality Management philosophy can be taught and learnt but not these 4 ingredients: they have to be developed by individuals: they require a different type of personnel with certain attitudes and commitment.

i)   **Honesty** : Solving a problem requires admitting that it exists: and thus,improving a process requires first acknowledging that there is room for improvement. After acknowledging the

problem, next step is to determine who has the power to correct it. In most of the cases, it is the management.

ii)   **Shared Vision**: Continuous process improvement requires the participation of every one involved. Support for total quality requires a shared vision that process can be improved and that similar improvements are possible in design, output and cost, as well.

iii) **Patience**: Enhancing quality of a product or service through continuous process improvement requires study and a good deal of time,enery and money. Hence, great patience is required

iv)   **Without commitment**: frustration is likely to dampen your enthusiasm and efforts, particularly when your patience wanes. It is here that commitment assumes significance. Commitment must come from all, at all levels.

4.2. Six Foundations of TQM:

Many thinkers have contributed to the philosophy of Total Quality Management, notable amongst them are Quality gurus like Edward Deming (1980) Juran (1988) Crosby (1979) and others. Principals of Total Quality Management are neither new nor unique. What is new is the recognition that we can and must persue quality consciously, in a systematic manner.   The theory of Total Quality Management is built on six foundations, which are described below :-

4.2.1 Mission And Customer Focus :

Understanding and improving quality requires knowing what we do, why we do, for whom we do. A mission statement of an organization should mention the purpose of the organization, the customers whom it intends to serve and how it would like to serve them.

Knowing our mission and customers, it is possible to measure performance against stated

purposes. Such measurements provide feedback and allows the organization to improve quality of design, process and output.

4.2.2. Vision:

If mission spells out what an organization does and for whom it does it, vision tells us where the organization is going. A vision statement tells us what the organization will be like when its mission and goals are attained. The vision declares what the organization wants to become. Without a vision, an organization or any unit therof, interested in the pursuit of quality, is likely to spin its wheels without advancing or improving.

4.2.3 Continuous Process Improvement (C.P.I.)

Processes – the flow of activities – are the means by which we carry out our mission. We pay attention to inputs (students admitted with higher & higher % of marks at the qualifying examination) Design (design of curricula to meet the changing needs of industry) and output (number of graduates passing out of the institution) but pay little attention to the improvement of the educational process (teaching-learning process, industry institution interaction personality development etc.) TQM philosophy lays stress on improvement of these processes on a

continuous unending basis, which involves elimination of scrap, rework and unnecessary non-value adding processes.

4.2.4 Scientific Approach :

Edward Deming conveys the significance of data and analysis, when he says " In God we trust, all other must use data" TQM has its roots in Statistical Quality Control (SQC). Organizations now use statistics increasingly to model processes and determine ways of improving both processes and output. In TQM, one has to use scientific methods which Shewhart has described as Plan-do-check-act (PDCA) cycle.

Plan : Identify the process in need of improvement, analyze the problems and make a proposal for changes in the process for improvement.

Do: Try this change and note the results.

Cheque : Check whether the proposed change has taken place and if so, to what extent.

Act: If the desired change is satisfactory, implement the change or else try an alternative.

Flow charts, cause and effect diagrams, pareto charts, check lists histograms, scatter diagrams and run and control charts are some of the tools frequently used in TQM. Data collection and statistical analysis help us to identify where variation exists and the causes for the same. There are two causes of variations – special causes & common causes. These can and should be eliminated . Common causes are inherent in the process, occur regularly and have wider affects. These cause rework, scrap and un-necessary emplexities. These have to be identified and variations from common causes need to be reduced through careful, data based, and permanent changes in the processes.

A process without special causes is said to be "in control "that is, it is stable and predicable. Once a process is in control, quality improved can be achieved by reducing the variations for further.

4.2.5 Promoting Participation:

This "Total" implies involvement and participation of all the people in the organization. As N.J.Irani, Managing Director of TISCO, Jamshedpur, said "Total Quality is akin to total war. As in war, every person within the nation and from each sphere of activity is involved, directly or indirectly, so also in an organization wedded to quality. Every division and employee is involved in quality improvement efforts"

This involvement & participation can be

meaningful only if necessary empowerment is there. Hence, necessary empowerment has to be provided to each individual.

4.2.6 System Approach :

Wherever changes are to be brought in, systems approach has to be adopted. If change is piecemeal, it results in confusion. Hence, a systems approach is a must.

Thus the TQM structure is based on six foundations of (i) Mission & Focus on Customs (ii) Vision (iii) Continuous Improvement Process (iv) Scientific approach (v) total involvement & Participation & (vi) Systems approach.

5.0 Thus TQM is a philosophy of Continuous Improvement

which can provide any institute with a set of practical tools for meeting and exceeding the present and future needs, wants & expectations of the customer.

It is not an imposition, it cannot be done for you. The urge for TQM must come from within the Institution.

It is not inspection. It is about always trying to do things right first time and every time, rather than occasionally checking if they have gone wrong TQM is not to work someone else's agenda unless the agenda is specified by your customers & clients. It is not something which only senior managers do and pass on to the lower ranks. The "Total" in TQM indicates / dictates that everything and everybody in the organization is involved in continuous improvement process.

TQM involves two slightly different aspects (i) CPI & (ii) Tools & Equipments used to put quality improvement into actions.

TQM is both a mind set and a set of practical activities – an attitude of mind as well as a method of promoting C.P.I. TQM is a practical but strategic approach to running an organization which focuses on the needs of the customers and clients. It rejects any outcome other than excellence. It is not a set of slogans. It is a deliberate, conscious planned approach to achieve desired level of Quality in a consistent fashion which meets & exceeds the needs and wants of the clients and customers. It is a philosophy of never ending C.P.I. only achievable by and through the people to satisfy and exceed the needs and wants of the customer and exceed them in a consistent fashion. It is a broad based philosophy with an action plan accompanied by tools and techniques for implementation of quality measures for any type of organization which wants to grow and prosper and acquire a competitive edge, so much essential in the global market today. It is applicable to all types of organization, be it a manufacturing one or service one or even an educational institute / a hospital / a charity / trust working for the cause of social upliftment. Only it needs to be adapted and adopted to suit the objects, working style, work culture and environment of a particular organization.

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