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Total Quality Management (TQM) is a comprehensive and structured approach to organizational management that seeks to improve the quality of products and services through ongoing refinements in response to continuous feedback. TQM requirements may be defined separately for a particular organization or may be in adherence to established standards, such as the International Organization for Standardization's ISO 9000 series. TQM can be applied to any type of organization; it originated in the manufacturing sector and has since been adapted for use in almost every type of organization imaginable, including schools, highway maintenance, hotel management, and churches. As a current focus of e-business, TQM is based on quality management from the customer's point of view.

Total quality management (TQM) consists of organization-wide efforts to install and make permanent a climate in which an organization continuously improves its ability to deliver high-quality products and services to customers. While there is no widely agreed-upon approach, TQM efforts typically draw heavily on the previously developed tools and techniques of quality control. TQM enjoyed widespread attention during the late 1980s and early 1990s before being overshadowed by ISO 9000, Lean manufacturing, and Six Sigma.

In the late 1970s and early 1980s, the developed countries of North America and Western Europe suffered economically in the face of stiff competition from Japan's ability to produce high-quality goods at competitive cost. For the first time since the start of the Industrial Revolution, the United Kingdom became a net importer of finished goods. The United States undertook its own soul-searching, expressed most pointedly in the television broadcast of If Japan Can... Why Can't We? Firms began re-examining the techniques of quality control invented over the past 50 years and how those techniques had been so successfully employed by the Japanese. It was in the midst of this economic turmoil that TQM took root.
The exact origin of the term "total quality management" is uncertain. It is almost certainly inspired by Armand V. Feigenbaum's multi-edition book Total Quality Control (OCLC 299383303) and Kaoru Ishikawa's What Is Total Quality Control? The Japanese Way (OCLC 11467749). It may have been first coined in the United Kingdom by the Department of Trade and Industry during its 1983 "National Quality Campaign". Or it may have been first coined in the United States by the Naval Air Systems Command to describe its quality-improvement efforts in 1985.

THE EVOLUTION OF TQM

In 1920's statistical theory began to be applied effectively to the quality control concept later in 1924 Shewhart made the first sketch of a modern control chart. His works was later developed by process control. After the World War II Japan's industrial system was having a poor image of imitation of products and having an illiterate workforce.

The Japanese recognized these problems and their values concerned with quality and continuous improvement the total quality management become popular in 1950's as it tried to recover Japanese economy from the spoils of World War II. During the 1980's Japan's exports into the USA and Europe increased significantly due to its cheaper, higher quality products, compared to the western countries.

Formation of TQM in India

In the early 1980's, confederation of Indian industries (CII) took the initiatives to set up TQM practices in India in 1982 quality circles were introduced for first time in India. The companies under which the quality circles were launched are Bharat Electronics Ltd, Bangalore and Bharat Heavy Electricals Ltd, Trichy. In 1986 CII invited professor Ishikawa to India, to address Indian Industry about quality. In 1987, a TQM division was set up the CII this division had 21 companies agreed to contribute resources to it and formed the National committee on quality.

In February 1991 an Indian company with assistance of the CII, obtained the first ISO 9000 certification in India. In 1996, the Govt. of India announced the setting up of quality council of India and a national agency for quality certification was setup as a part of WTO agreement.
TQM is a management philosophy that seeks to integrate all organizational functions (marketing, finance, design, engineering, and production, customer service, etc.) to focus on meeting customer needs and organizational objectives.

TQM views an organization as a collection of processes. It maintains that organizations must strive to continuously improve these processes by incorporating the knowledge and experiences of workers. The simple objective of TQM is “Do the right things, right the first time, every time.” TQM is infinitely variable and adaptable. Although originally applied to manufacturing operations, and for a number of years only used in that area, TQM is now becoming recognized as a generic management tool, just as applicable in service and public sector organizations. There are a number of evolutionary strands, with different sectors creating their own versions from the common ancestor. TQM is the foundation for activities, which include:

- Commitment by senior management and all employees
- Meeting customer requirements
- Reducing development cycle times
- Just in time/demand flow manufacturing
- Improvement teams
- Reducing product and service costs
- Systems to facilitate improvement
- Line management ownership
- Employee involvement and empowerment
- Recognition and celebration
- Challenging quantified goals and benchmarking
- Focus on processes / improvement plans
- Specific incorporation in strategic planning

This shows that TQM must be practiced in all activities, by all personnel, in manufacturing, marketing, engineering, R&D, sales, purchasing, HR, etc.

**Principles of TQM**

The key principles of TQM are as following:

**Management Commitment**

- Plan (drive, direct)
- Do (deploy, support, participate)
- Check (review)
- Act (recognize, communicate, revise)

**Employee Empowerment**
- Training
- Suggestion scheme
- Measurement and recognition
- Excellence teams

**Fact Based Decision Making**
- Statistical Process Control (SPC)
- Design of Experiments (DOE),
- Failure Mode Effects Analysis (FMEA)
- The 7 statistical tools
- TOPS (Ford 8D – team-oriented problem solving)

**Continuous Improvement**
- Systematic measurement and focus on Cost of Non Quality (CONQ)
- Excellence teams
- Cross-functional process management
- Attain, maintain, improve standards

**Customer Focus**
- Supplier partnership
- Service relationship with internal customers
- Never compromise quality
- Customer driven standards

**The Concept of Continuous Improvement by TQM**
TQM is mainly concerned with continuous improvement in all work, from high level strategic planning and decision-making, to detailed execution of work elements on the shop floor. It stems from the belief that mistakes can be avoided and defects can be prevented. It
leads to continuously improving results, in all aspects of work, as a result of continuously improving capabilities, people, processes, and technology and machine capabilities.

Continuous improvement must deal not only with improving results, but more importantly with improving capabilities to produce better results in the future. The five major areas of focus for capability improvement are demand generation, supply generation, technology, operations and people capability.

A central principle of TQM is that mistakes may be made by people, but most of them are caused, or at least permitted, by faulty systems and processes. This means that the root cause of such mistakes can be identified and eliminated, and repetition can be prevented by changing the process.

There are three major mechanisms of prevention:

1. Preventing mistakes (defects) from occurring (mistake-proofing or poka-yoke).
2. Where mistakes can’t be absolutely prevented, detecting them early to prevent them being passed down the value-added chain (inspection at source or by the next operation).
3. Where mistakes recur, stopping production until the process can be corrected, to prevent the production of more defects.

**Implementation Principles and Processes**

A preliminary step in TQM implementation is to assess the organization’s current reality. Relevant preconditions have to do with the organization’s history, its current needs, precipitating events leading to TQM, and the existing employee quality of working life. If the current reality does not include important preconditions, TQM implementation should be delayed until the organization is in a state in which TQM is likely to succeed.

If an organization has a track record of effective responsiveness to the environment, and if it has been able to successfully change the way it operates when needed, TQM will be easier to implement. If an organization has been historically reactive and has no skill at improving its operating systems, there will be both employee scepticism and a lack of skilled change agents. If this condition prevails, a comprehensive program of management and leadership development may be instituted. A management audit is a good assessment tool to identify current levels of organizational functioning and areas in need of change. An organization should be basically healthy before beginning TQM. If it has significant problems such as a
very unstable funding base, weak administrative systems, lack of managerial skill, or poor employee morale, TQM would not be appropriate.

However, a certain level of stress is probably desirable to initiate TQM. People need to feel a need for a change. Kanter (1983) addresses this phenomenon by describing building blocks which are present in effective organizational change. These forces include departures from tradition, a crisis or galvanizing event, strategic decisions, individual “prime movers,” and action vehicles. Departures from tradition are activities, usually at lower levels of the organization, which occur when entrepreneurs move outside the normal ways of operating to solve a problem. A crisis, if it is not too disabling, can also help create a sense of urgency which can mobilize people to act. In the case of TQM, this may be a funding cut or threat, or demands from consumers or other stakeholders for improved quality of service. After a crisis, a leader may intervene strategically by articulating a new vision of the future to help the organization deal with it. A plan to implement TQM may be such a strategic decision. Such a leader may then become a prime mover, who takes charge in championing the new idea and showing others how it will help them get where they want to go. Finally, action vehicles are needed and mechanisms or structures to enable the change to occur and become institutionalized.

Steps in Managing the Transition

Beckhard and Pritchard (1992) have outlined the basic steps in managing a transition to a new system such as TQM: identifying tasks to be done, creating necessary management structures, developing strategies for building commitment, designing mechanisms to communicate the change, and assigning resources.

Task identification would include a study of present conditions (assessing current reality, as described above); assessing readiness, such as through a force field analysis; creating a model of the desired state, in this case, implementation of TQM; announcing the change goals to the organization; and assigning responsibilities and resources. This final step would include securing outside consultation and training and assigning someone within the organization to oversee the effort. This should be a responsibility of top management. In fact, the next step, designing transition management structures, is also a responsibility of top management. In fact, Cohen and Brand (1993) and Hyde (1992) assert that management must be heavily
involved as leaders rather than relying on a separate staff person or function to shepherd the
effort. An organization wide steering committee to oversee the effort may be appropriate.
Developing commitment strategies was discussed above in the sections on resistance and on
visionary leadership.

To communicate the change, mechanisms beyond existing processes will need to be
developed. Special all-staff meetings attended by executives, sometimes designed as input or
dialog sessions, may be used to kick off the process, and TQM newsletters may be an
effective ongoing communication tool to keep employees aware of activities and
accomplishments.

Management of resources for the change effort is important with TQM because outside
consultants will almost always be required. Choose consultants based on their prior relevant
experience and their commitment to adapting the process to fit unique organizational needs.
While consultants will be invaluable with initial training of staff and TQM system design,
employees (management and others) should be actively involved in TQM implementation,
perhaps after receiving training in change management which they can then pass on to other
employees. A collaborative relationship with consultants and clear role definitions and
specification of activities must be established.

In summary, first assess preconditions and the current state of the organization to make sure
the need for change is clear and that TQM is an appropriate strategy. Leadership styles and
organizational culture must be congruent with TQM. If they are not, this should be worked on
or TQM implementation should be avoided or delayed until favourable conditions exist.

Remember that this will be a difficult, comprehensive, and long-term process. Leaders will
need to maintain their commitment, keep the process visible, provide necessary support, and
hold people accountable for results. Use input from stakeholder (clients, referring agencies,
funding sources, etc.) as possible; and, of course, maximize employee involvement in design
of the system.

Always keep in mind that TQM should be purpose driven. Be clear on the organization’s
vision for the future and stay focused on it. TQM can be a powerful technique for unleashing
employee creativity and potential, reducing bureaucracy and costs, and improving service to clients and the community.

**TQM Five main advantages:**

1. Encourages a strategic approach to management at the operational level through involving multiple departments' across functional improvement and systemic innovation processes.
2. Provides high return on investment through improved efficiency.
3. Works equally well for service and manufacturing sectors
4. Allows organizations to take advantage of developments that enable managing operations as cross-functional processes.
5. Fits an orientation toward inter-organizational collaboration and strategic alliances through establishing a culture of collaboration among different departments within organization.

**CONCEPTS OF THE TQM PHILOSOPHY**

The specific concepts that make up the philosophy of TQM are:

1. **Customer Focus:** Quality is defined as meeting or exceeding customer expectations. The goal of management should be to identify and meet the customers' needs. Therefore quality is customer driven. Customer focus keeps the business competitive in every level of market change.

2. **Continuous Improvement:** One of the powerful TQM philosophy is the focus on continuous improvement. Continuous improvement is called kaizen by the Japanese which make the company continuously to learn and to be problem solving. Because we can never achieve perfection we must always evaluate our performance and take measures to improve it. The two approach that helps in continuous improvement are PDSA cycle ([THE PLAN, DO, STUDY, ACT (PDSA) CYCLE](#)) and benchmarking.

3. **Employee Empowerment:** TQM philosophy is to empower all employees to seek out quality problems and correct them. Today workers are empowered with decision making power to decide quality in the production process, their contributions are
highly valued and workers suggestions to improve quality are implemented. This employee empowerment can be made through team approach have quality circle where a team of volunteer production employees and their supervisors who meet regularly to solve quality problems.

4. **Use of Quality Tools:** For identification of quality related issues employees should be trained with the quality tools to identify the possible issues and to correct problems. These are often called the 'seven tools of quality control' they are:
   1. Cause and effect diagrams.
   2. Flow charts.
   3. Checklist.
   4. Control charts.
   5. Scatter Diagrams.
   6. Pareto Analysis

To build a quality the company's product design must meet customer's expectation and quality function deployment is a tool used to translate the preferences of the customer into specific technical requirements, it enables us to view the relationships among the variables involved in the design of a product, such as technical versus customer requirements.

5. **Process Management:** Under TQM quality of a product comes through continuous quality process. Therefore quality at the source is the belief that it is far better to uncover the source of quality problems and correct it than to discard defective items after production. The new concept of quality focuses on identifying quality problems at the source and correcting them.

6. **Managing Supplier Quality:** The philosophy of TQM extends the concept of quality to suppliers and ensures that they engage in the same quality practices. If suppliers meet present quality standards, materials do not have to be inspected upon arrival. Today many companies have a representative residing at their supplier's location, there by involving the supplier in every stage from product design to final production.
Principles of quality management:

There are eight principles of quality management:

- **Customer-focused organisation** - organisations depend on their customers and therefore should understand current and future customer needs, meet customer requirements and strive to exceed customer expectations.

- **Leadership** - leaders establish unity of purpose, direction and the internal environment of the organisation. They create the environment in which people can become fully involved in achieving the organisation's objectives.

- **Involvement of people** - people at all levels are the essence of an organisation and their full involvement enables their abilities to be used for the organisation's benefit.

- **Process approach** - a desired result is achieved more efficiently when related resources and activities are managed as a process.

- **System approach to management** - identifying, understanding and managing a system of interrelated processes for a given objective contributes to the effectiveness and efficiency of the organisation.

- **Continual improvement** - continual improvement is a permanent objective of an organisation.

- **Factual approach to decision making** - effective decisions are based on the logical and intuitive analysis of data and information.

- **Mutually beneficial supplier relationships** - mutually beneficial relationships between the organisation and its suppliers enhance the ability of both organisations to create value.

Dr. Kaoru Ishikawa

Dr. Ishikawa suggests seven tools and he believed these tools should be known widely as 'seven basic tools of quality' they are:

1. **Pareto analysis** : Pareto analysis is designed by Alfredo pareto. The pareto diagram is a form of bar chart with the items arranged in descending order so that one can identify the highest contributing factors to a problem. This technique prioritises the types or sources of problems.
2. **Stratification**: The main objective of stratification is to grasp a problem or to analyse its causes by looking at possible and understandable factors or items. Eg: Data collected of a single population is divided by time, work force, machinery working methods, raw materials, so on in to a number of strataums to find certain characteristics among the data or they are same or similar.

3. **Histograms**: A histogram is a graphical representation of the variation in a set of data. Histograms are another form of bar chart in which measurement are grouped into bins, in this case each bin represent a range of values of some parameter. It shows the frequency or number of observations of a particular value or with n as specified group.

4. **Scatter Diagrams**: A scatter diagrams examines the relationship between paired data, scatter diagrams are mainly used in quality circles when it wants to establish the relationship between cause and effect, the relationship between one cause and another Eg. Relationship between an ingredient and the hardness of a product, relationship between the speed of cutting and the variation in the length of parts cut.

5. **Process Control charts**: Process control charts are the most complicated of the seven basic tools of TQM. These tools are part of statistical process control; the charts are made by plotting in sequence the measured value of samples taken from a process.

6. **Check sheet**: Check sheet are forms used to collect data in an organized manner. They are used to validate problems or causes or to check progress during implementation of solutions. Check sheets come in several types, depending on the objective for collection data. Some of the types are:
   
   I. Recording check sheet
   II. Location check sheet
   III. Checklist check sheet

7. **Cause and Effect Diagram**: The cause and effect diagram is the brilliant scientific diagram by Dr. Kaoru Ishikawa who pioneered quality management processes and became one of the founding *father of modern quality management*.

*The Cause and Effect diagram* is used to identify all the potential causes that result in a single effect. Firstly all causes are arranged on the basics of their level of importance and resulting in a depiction of relationships and hierarchy of events by this the root cause is identified the areas of occurrence of problems is found with the use of Ishikawa diagram.
When there is a team approach to problem solving the Ishikawa diagram is the powerful tool to capture different ideas and stimulate the team's brainstorming to diagram is also called fish bone diagram or cause and effect diagram.

The fishbone diagram expresses the various causes to specific problem and its effect if a quantitative data is available it is a comprehensive tool for in-depth analysis.

**TQM & ISO STANDARDS**

Organizations achieve success when they implement certain quality standards in their practice. Let us discuss ISO and its standards to improve total quality. The International organization for standardization was founded in 1946 in Geneva, Switzerland; ISO has more than 90 member countries. The ISO had the Technical committee of 176 developed an improved international standards for quality system in 1987.

The ISO 9000 series of standards are designed in such a way that it can be tailored to fit any such a way that it can be tailored to fit any organization's needs, it can be applied to all small medium enterprise, manufacturing unit or a service organization.

The ISO 9000 series of standards can be applied to construction, engineering, healthcare, and other professional services. The ISO 9000: 2000 standards focus on developing, documenting and implementing procedures to ensure consistency of operations and performance in production and service delivery processes for continuous improvement supported by fundamental principles of TQM. The standards consist three documents:

1. **ISO 9000:2000 Quality Management Systems** (fundamentals and vocabulary) this part discusses the fundamental concepts related to the quality management systems it gives definitions of key terms of other two standards

2. **ISO 9001:2000 Quality management systems** -this part provides the standards used for registration by demonstration conformity of the QMS to customers, regulators and the organizations own requirements.

3. **ISO 9004:2000 QMS: guidelines for performance** -this part provide guidelines that an organization can use to establish a QMS focused on improving performance and quality standards.

**ISO Standards in India**

*Bureau of Indian Standards* (BIS) has prepared an Indian standard and Quality Management

2. ISO 10019:2005 Guidelines for the selection of quality management system consultants and use of their services.

3. ISO 15650:2006 Quality management systems Guidelines for implementation of ISO.

4. ISO/IEC 17021:2006 conformity assessment requirements for bodies providing audit and certification of management systems.


**Five Principles of TQM**

In order to exceed customer expectations, an organization must embrace five principles:

- Produce quality work the first time
- Focus on the customer
- Have a strategic approach to improvement
- Improve continuously
- Encourage mutual respect and teamwork

- **Producing quality work (the first time)** means quality is built into the processes for producing products or providing services, and continual improvement measures are taken to ensure the processes work every time. Employees are empowered to make decisions to improve a process and are provided with continual training to develop their skills.

The purchasing department at Fun Time Travel evaluates data on client purchases to determine which packages are most popular with clients. This helps them to determine what stays and what goes. The information technology technicians monitor the website continually to assess whether clients are just browsing or actually making purchases. The IT guys also evaluate how long a booking takes to determine whether changes need to be made to the check-out process.

- **Focusing on the customer** involves designing products or services that meet or exceed the customer's expectations. This involves the product itself, its functionality,
attributes, convenience and even the means by which the information about a product is received by a client.

The marketing department is responsible to get the cyber-word out to potential clients. Marketers use a wide variety of media sources, like social networking, email and even texting, to get the word out about Fun Time's website. If they notice traffic is not moving toward the website or that clients are not staying online long enough, they will make strong suggestions to the IT department and the research and development department to make changes immediately.

- **By having a strategic approach to improvement**, processes are developed and tested to ensure the product or service's quality. This also involves making sure suppliers offer quality supplies needed to produce products. The purchasing department monitors client reviews to determine whether the ratings on the website are similar to those of actual past customers. This makes it possible for purchasing to add more travel packages to the company's inventory.

- **Improving continuously** means always analyzing the way work is being performed to determine if more effective or efficient ways are possible, making improvements and striving for excellence all the time. The human resources department is interested in making sure employees are qualified to perform their jobs. By having qualified and trained employees on the team, the website will run effectively. Calls to the travel desk will be handled efficiently. Any interruption to the booking process will be quickly fixed, and improvements will be made.

- **Encouraging mutual respect and team work** is important because it fosters a single-organizational culture of excellence by knowing that every employee from top to bottom of the hierarchy holds the same core principles at heart. The entire team at Fun Time Travel work together to make viewing, planning and booking a vacation on their website a pleasurable and easy experience. This requires an inter-departmental approach to TQM.

**TQM Implementation Approaches**

You can't implement just one effective solution for planning and implementing TQM concepts in all situations. Below we list generic models for implementing total quality management theory:
1. Train top management on TQM principles.
2. Assess the current: Culture, customer satisfaction, and quality management system.
3. Top management determines the core values and principles and communicates them.
4. Develop a TQM master plan based on steps 1, 2, 3.
5. Identify and prioritize customer needs and determine products or service to meet those needs.
6. Determine the critical processes that produces those products or services.
7. Create process improvement teams.
8. Managers supports the efforts by planning, training, and providing resources to the team.
9. Management integrates changes for improvement in daily process management. After improvements standardization takes place.
10. Evaluate progress against plan and adjust as needed.
11. Provide constant employee awareness and feedback. Establish an employee reward/recognition process.

**Strategies to develop TQM**

1. **TQM elements approach**: Take key business process and use TQM Tools to foster improvement. Use quality circles, statistical process control, taguchi method, and quality function deployment.
2. **The guru approach**: Use the guides of one of the leading quality thinker.
3. **Organization model approach**: The organization use benchmarking or MBNQA as model for excellence.
4. **Japanese total quality approach**: Companies pursue the deming prize use deming principles

**Benefits of TQM**

Research shows that the Malcolm Baldrige National quality award winners outperformed the S&P 500 by greater than 4-to-1, achieving a 248.7% return on investment, compared with 58.5% for the S&P 500.
TQM has numerous benefits. It enables organizations to:

- Attain higher profitability and increased market share
- Improve customer satisfaction
- Improve organizational productivity
- Improve employee morale and job satisfaction
- Create a positive work culture
- Undertake systematic problem solving and decision making through project teams
- Improve teamwork
- Create a climate conducive to continuous improvement

**Fifteen Maxims on Quality Improvement**

1. **Top management's visible commitment and explicit involvement.** Without top management's visible commitment and explicit involvement, quality improvement efforts will never be successful. A U.S. General Accounting Office study concluded, "Ultimately, strong visionary leaders are the most important element of a quality management approach. Top management holds the key to quality improvement as it determines the various systems in which people work. According to W. Edwards Deming, management is responsible for as much as 94% of a company's quality problems. Joseph M. Juran puts the figure as 85% or more. Moreover, the actions of employees greatly depend on top management's attitude towards quality.

2. **Strategic Quality Planning.** A Strategic Quality Plan is absolutely vital for an organization to develop competitive advantage and effectively manage organizational quality improvement efforts. It sets the organizational mission statement, specifies key quality goals, promotes collective action and determines the strategies of how the organization is going to attain its mission and quality goals.
3. **Organizational quality awareness.** Organizational quality awareness is necessary to gain employee support for quality improvement efforts and reducing potential resistance to change. All employees must fully understand the need for quality improvement, how quality relates to their jobs and how it can be measured and improved. Many quality improvement efforts have failed in the past due to neglect of organizational quality awareness programmes. Numerous organizations made the mistake of plunging directly into quality improvement efforts.

4. **Quality through people.** Quality begins and ends with the individual. Quality people do quality work. People manage processes and make the systems work; processes don't do work, people do. In short, quality is the expression of human excellence. Quality improvement efforts should focus more on people rather than on techniques and machines. Management must have faith in the ability of employees to produce quality work. Employees must be given the opportunity to realize their full potential through training, participation and empowerment.

5. **A Culture of Quality.** Successful organizations have a culture that creates and sustains a work environment that is conducive to long-lasting quality improvement. Quality is deeply embedded in virtually every aspect of organizational life. Culture is important as it influences employee behaviour and action towards work, customers and one another. Satisfied employees help to create satisfied external customers. Some of the core values of a Culture of Quality are customer focus, employee autonomy, teamwork, open and honest communication, basing rewards on quality work and Doing the right things right the first time, every time.

6. **Quality management structure.** A suitable organizational structure is necessary to ensure effective and efficient management of quality improvement efforts. The quality management structure would depend upon the size of the organization and the nature of its business. However, most successful organizations have a Corporate Quality Council consisting of the top management team, a TQM Manager and Divisional Quality Councils. The major responsibilities of the Corporate Quality Council are to set an overall strategic quality improvement plan for the company, review and approve divisional quality improvement plans and cooperation and monitor quality improvement efforts. The TQM Manager assists the Corporate
Quality Council in planning and implementing organization-wide quality improvement efforts. The Divisional Quality Councils set specific quality goals, formulate plans of action and implement quality improvement efforts at the divisional level.

7. **Customer-driven.** Quality is defined and judged by the customers. The mission of quality organizations is centred on customer satisfaction. Organizational processes and procedures are designed to meet the requirements of both the external and internal customers. Market research must be undertaken to determine the requirements of external customers, how well is the organization meeting them and what are the areas for improvement as perceived by the customers. Customer’s complaints should be tracked and acted upon promptly. With regard to the internal customers, employee opinion surveys should be undertaken to determine, inter alia, their views on how the organization is run and how quality can be improved.

8. **Process Management.** Long-lasting quality improvement is attained through preventive management (building quality into the work processes, particularly key processes). All work ranging from administrative to engineering is a process. A process is essentially a sequence of tasks or activities that transforms inputs into desired outputs. A. R. Tenner and I. J. DeToro define a process as "the sequential integration of people, materials, methods and machines in an environment to produce value-added outputs for customers." Process management stresses conformance to customers' requirements and reduction in cost of quality by producing output in the most effective and efficient manner.

9. **Teamwork.** Teamwork is vital as the success of quality improvement efforts is greatly dependent on close cooperation between managers and employees and among departments. Teamwork generally enhances the quality of decision-making; helps to break down departmental barriers; and creates a sense of ownership and commitment. Teamwork can be encouraged by creating cross-functional Quality Improvement Teams.
10. **Management by Fact.** TQM involves systematic and fact-based decision making. Facts or reliable data and not opinions or hearsay form the basis of making intelligent decisions or solving problems systematically.

11. **Training.** A TQM organization is a learning organization. Training is viewed as a valuable investment and not as an unnecessary expense. Companies noted for world-class quality typically devote 40-80 hours per year, per person to training. Training sessions must start with top management and cascade down the organization. Training should be related to actual work performed by employees. Managers should train their own work groups. Quality training should cover quality awareness, basic quality concepts and tools, process management, problem solving, and team building.

12. **Reward and recognition systems.** The reward and recognition systems must be aligned with quality improvement efforts. Recognition and rewards must be based on quality work and not on seniority or other non-merit factors. Examples of recognition and rewards are bonuses, merit certificates and pay increase. Quality success stories should be publicised.

13. **Quality standards.** Quality standards are important as they help to clarify work roles, communicate priorities and form the benchmark for assessing and rewarding employee performance. In short, what gets measured gets done. Quality standards can be set in terms of reliability, responsiveness and courtesy of frontline employees. Quality standards should be customer-oriented, specific and verifiable, realistic and challenging, and mutually established and agreed upon by management and employees.

14. **Measurement.** Measurement is a prerequisite to any quality improvement effort. Quality is defined as "meeting or exceeding customers' requirements consistently". These requirements have to be quantified and measured to determine the success of quality improvement efforts. Measurement provides a data base for decision-making, establishing customers' requirements, identifying opportunities for quality improvement, and assessing performance.

**Continuous improvement.** Quality is a moving target. There is no one best or optimum level of quality. Companies have to continuously improve the quality of their products and
services to stay ahead in an increasingly competitive business world. Technological changes often render current "quality" products as obsolete. Customer expectations often change over time. Hence, quality improvement is a never-ending journey. In this regard, the organizational work climate should promote employee creativity, and problems viewed as opportunities for improvement.

**Development in the United States**

In the spring of 1984, an arm of the United States Navy asked some of its civilian researchers to assess statistical process control and the work of several prominent quality consultants and to make recommendations as to how to apply their approaches to improve the Navy's operational effectiveness. The recommendation was to adopt the teachings of W. Edwards Deming. The Navy branded the effort "Total Quality Management" in 1985.

The private sector followed suit, flocking to TQM principles not only as a means to recapture market share from the Japanese, but also to remain competitive when bidding for contracts from the Federal Government since "total quality" requires involving suppliers, not just employees, in process improvement efforts.

**Features**

There is no widespread agreement as to what TQM is and what actions it requires of organizations, however a review of the original United States Navy effort gives a rough understanding of what is involved in TQM.

The key concepts in the TQM effort undertaken by the Navy in the 1980s include "Quality is defined by customers' requirements."

- "Top management has direct responsibility for quality improvement."
- "Increased quality comes from systematic analysis and improvement of work processes."
- "Quality improvement is a continuous effort and conducted throughout the organization."

The Navy used the following tools and techniques:

- The PDCA cycle to drive issues to resolution
- Ad hoc cross-functional teams responsible for addressing immediate process issues
- Standing cross-functional teams responsible for the improvement of processes over the long term
- Active management participation through steering committees
- Use of the Seven Basic Tools of Quality to analyze quality-related issues

TQM processes are divided into four sequential categories: plan, do, check, and act (the PDCA cycle). In the planning phase, people define the problem to be addressed, collect relevant data, and ascertain the problem's root cause; in the doing phase, people develop and implement a solution, and decide upon a measurement to gauge its effectiveness; in the checking phase, people confirm the results through before-and-after data comparison; in the acting phase, people document their results, inform others about process changes, and make recommendations for the problem to be addressed in the next PDCA cycle.

**Total Quality Management in Higher Education**

“TQM was initially used for the measurement of quality in the Higher Education sector in 1993” (Clayton, 1993). In fact the concept of TQM has come to Higher Education HE from the business communities. Ideally education should not be related to business as it is to develop values and the personality of a student. Higher Education too is to make students a learned person and a qualified professional and eventually a good citizen. But there is a clear component of business as Higher Education charge fees from the students and hence students become selective in choosing the universities and the course they want to study. Keeping these points in mind the significance of TQM in Higher Education can be discussed in two sub-headings (1) Higher Education as a business and (2) Higher Education as service for human development.

**(1) Higher Education as a business**

Some authors believe that universities should be considered as a business because they have to compete with other universities and their funding resources are limited hence they need to generate money. Arjomandi (2009) claims that in twenty first century universities have to adopt business-like strategies to cope with the increasing market competition and limited funding opportunities. That is why implementation of quality management has become
important in Higher Education. Moreover, Higher Education is like enterprises as they collect the fees [money] in cash which is the life blood of any enterprise (Warner and Palfreyman, 2000). Tuition fees for overseas students give them a chance to do business as it is a matter of individual institution. Generally the fees of overseas students are higher than those of the natives.

The universities, therefore, need to maintain quality as they have to attract students to fulfil their funding needs. As the students pay fees they examine not only the quality of education provided by a university but also other services like student support services, student learning resources, student communication and representation and student assessment. In fact they act as consumers. So it becomes important for the universities to assure quality by accreditation and outcome assessment. TQM might support better inputs by focusing on students’ achievement, good faculty members and other facilities like library and laboratory to get better output as high quality outputs results if high quality inputs exist.

(2) **Higher Education as a service for human development**

Higher Education, in general, is considered to encourage personal growth and social responsibilities in an individual, in addition to his professional training and academic development. It also educates students to become civic responsible and a citizen of global society (CEPES, 2009). Higher Education must lead to ethical development of students while its process of imparting education. The standard of education has its direct impact on the development of the students’ understandings.

Gupta (1993) recognises ‘teaching’ [transfer of knowledge] as one of the most important activities which take place in any educational institute. According to him improvement in the quality of teaching is one of the most important aims of any professor in Higher Education. As teaching is a process of transforming knowledge it must have quality in it because without quality the process of teaching could not achieve the desired level of education. Though TQM is accepted as a concept in business organisations still it could be used as a tool to achieve the goal of improving quality in teaching. If teachers are committed to develop
values in students along with their professional training TQM might support to hire teacher with dedication to develop their students as good citizens.

In addition to teaching Higher Education is also considered to be the training for the research works. Barnett (1992), states that the members of academic community believes that to assure quality in education the research profiles of the staff is more important to the achievement of the students as students achieve success if they are in a small group, in the company of recognised researchers. A small group of students discourage business but encourage teaching and learning process.

The above discussion reveals that the quality management in Higher Education is important in either case. Higher Education need quality management to enhance the quality of education for better service to mankind as well as to fulfil the expectations of its students in order to keep their position secure.

The Twofold Continuous Quality Improvement (CQI) model by Sims and Sims, validates the role of TQM in Higher Education by explaining the approach to TQM.

Figure 2:  Source: Sims and Sims

The figure above describes the structure of twofold CQI that can help to achieve TQM in Higher Education. Twofold TQM focus addresses administrative processes as well as other basic offerings such as curricular, co-curricular and classroom aspects. CQI in many
universities addresses only the administrative processes and support services, however to assure total quality it is crucial that curricular, co-curricular and classroom aspects must be given the proper attention.

Thus the theories of Sims and Sims for the acceptance of TQM in Higher Education agree with the theory of three senses given by Voehl (1994). The three senses: ‘every process’ for example curriculum development, teaching and assessment, ‘every job’ like role of tutor and student service centre and ‘every person’ must be covered for a sustainable TQM in Higher Education. Every person must be responsible for his or her own work and should have passion, dedication, vision and eagerness to learn.

**Implementation of TQM in Higher Education in India**

Application of quality management in HE is not a new phenomenon in India. However like other developing countries it is a primary concern in India also to how to provide quality education to the large number of students at affordable costs (Prasad, 2005). Indian HE will have to maintain quality measures if it wants to become world class. Nike (2001) quoted by Pandiet al., (2009) strongly suggests the application of TQM to bring quality movement in HE in India to be recognised globally.

Though Indian HEIs are trying to ensure quality in education but it seems that they do not have emphasises on the core philosophy of TQM. Different bodies seem to adopt different theory of quality management. For example, certain technical HEIs institutions have adopted ISO 9000, TQM, Six Sigma, Kaizen, 5S and others strategies for quality improvement (Pandi and Rao, 2006).
University Grant Commission (UGC) a statutory body, established in 1956, is the body responsible for the growth of HE in India (Short, 2008). UGC established National Assessment and Accreditation Council (NAAC), a sub-agency, in 1994 to ensure quality in HE by the means of internal and external quality assessment and accreditation (ibid). Apart from UGC and NAAC the All India Council for Technical Education (AICTE), Medical Council of India (MCI), National Council for Teacher Education (NCTE) and Distance Education Council (DEC) are the other bodies working to assure quality and norms and standards in HE in India (AICTE 2009; NCTE 2011; MCI 2010; India Education, No date). As these bodies have their own they use their own pattern to assure quality (ibid).
NAAC, for example, is advocating the best practice benchmarking approach for the development of TQM in HE however, it seems that this approach not fully used in Indian HEIs. Prasad (2005) claims that, “Many higher education institutes do not attempt certain practices due to lack of information about the feasibility and adaptability of the best practice”. Failure of institutions to attempt practices of tools for quality management, like benchmarking, push them back and they fail to maintain standards and quality. Two third of India’s college and universities are below standard and even the top rated Indian institutions have severe limited capacity (Dukkipati, 2010).

Apart from benchmarking practice many Indian educational institutes are adopting ISO 9000 standards in order to improve the quality of educational provisions for last several years (Pandi and Rao, 2006). ISO 9000 is a framework of a quality management system which seeks the improvement of the quality of organisations like universities by systematic methods, defined responsibilities and documented processes. It refers to an institution’s overall working which is effectively TQM, as defined by me with the help of Voelh’s ‘House of Quality’. Considering the link between TQM and other quality management systems Pandi and Rao (2006) propose a model of Integrated Total Quality Management (ITQM) which uses the theory of different quality management systems with a common aim of sustainable TQM in HE system.
UGC has made many measures to ensure the quality of HE in India. However, there is much focus on the quality of education in technical educational institutes as it is believed that engineers and managers play a vital role in making a nation competitive to other countries. Pandi et al., (2009) claim that engineers play a major role in increasing nation’s wealth and power by generating employment opportunities. That is why technical educational institutes focus more on quality management.

AICTE, an apex body, set up in 1945 constituted National Board of Accreditation (NBA) in 1987 to periodically evaluate technical institutes on the basic of norms and standards and make recommendations to AICTE (NBA, 2009). For Engineering Institutes, for example, it has set norms for the building area, administrative area, instructional area, tutorial area, laboratories, workshops, computer centres, and library and seminar hall. It has also set the students teacher ratio and the essential qualification for the teachers for the HEIs. However, simply setting the framework does not assure the practice of quality management in any institute. Sengupta (2010) claims that different Institutes in India could not manage to abolish the difference in quality of education due to different reasons like lack of leadership quality, lack of infrastructure, lack of computer skills and lack of faculty. Technical colleges like software engineering colleges are struggling to employ qualified faculty which leads to the poor quality of teaching and hampers the total quality of the institution (Solanki et al., 2009). Moreover if they get the highly qualified teachers even then they fail to manage the quality of teaching as teachers teach the selected topics of their own interest.

Such attitude of teachers reflects the lack of leadership quality in them. It is harmful not only for the future of the students but also for the success of TQM in a HEI. Pandi and Rao (2006), argues that TQM is never happened by accident. It is a process which needs a serious planning. It involves efforts by the involvement of system, people and supporting tools.
TQM leadership from top management

TQM is a way of life for a company. It has to be introduced and led by top management. This is a key point. Attempts to implement TQM often fail because top management doesn't lead and get committed - instead it delegates and pays lip service. Commitment and personal involvement is required from top management in creating and deploying clear quality values and goals consistent with the objectives of the company, and in creating and deploying well defined systems, methods and performance measures for achieving those goals. These systems and methods guide all quality activities and encourage participation by all employees. The development and use of performance indicators is linked, directly or indirectly, to customer requirements and satisfaction, and to management and employee remuneration.

Continuous improvement

Continuous improvement of all operations and activities is at the heart of TQM. Once it is recognized that customer satisfaction can only be obtained by providing a high-quality product, continuous improvement of the quality of the product is seen as the only way to maintain a high level of customer satisfaction. As well as recognizing the link between product quality and customer satisfaction, TQM also recognizes that product quality is the result of process quality. As a result, there is a focus on continuous improvement of the company's processes. This will lead to an improvement in process quality. In turn this will lead to an improvement in product quality, and to an increase in customer satisfaction. Improvement cycles are encouraged for all the company's activities such as product development, use of EDM/PDM, and the way customer relationships are managed. This implies that all activities include measurement and monitoring of cycle time and responsiveness as a basis for seeking opportunities for improvement.

Elimination of waste is a major component of the continuous improvement approach. There is also a strong emphasis on prevention rather than detection, and an emphasis on quality at the design stage. The customer-driven approach helps to prevent errors and achieve defect-
free production. When problems do occur within the product development process, they are generally discovered and resolved before they can get to the next internal customer.

**Fast response**

To achieve customer satisfaction, the company has to respond rapidly to customer needs. This implies short product and service introduction cycles. These can be achieved with customer-driven and process-oriented product development because the resulting simplicity and efficiency greatly reduce the time involved. Simplicity is gained through concurrent product and process development. Efficiencies are realized from the elimination of non-value-adding effort such as re-design. The result is a dramatic improvement in the elapsed time from product concept to first shipment.

**Actions based on facts**

The statistical analysis of engineering and manufacturing facts is an important part of TQM. Facts and analysis provide the basis for planning, review and performance tracking, improvement of operations, and comparison of performance with competitors. The TQM approach is based on the use of objective data, and provides a rational rather than an emotional basis for decision making. The statistical approach to process management in both engineering and manufacturing recognizes that most problems are system-related, and are not caused by particular employees. In practice, data is collected and put in the hands of the people who are in the best position to analyze it and then take the appropriate action to reduce costs and prevent non-conformance. Usually these people are not managers but workers in the process. If the right information is not available, then the analysis, whether it be of shop floor data, or engineering test results, can't take place, errors can't be identified, and so errors can't be corrected.

**Employee participation**

A successful TQM environment requires a committed and well-trained work force that participates fully in quality improvement activities. Such participation is reinforced by reward and recognition systems which emphasize the achievement of quality objectives. On-going
education and training of all employees supports the drive for quality. Employees are encouraged to take more responsibility, communicate more effectively, act creatively, and innovate. As people behave the way they are measured and remunerated, TQM links remuneration to customer satisfaction metrics.

A TQM culture

It's not easy to introduce TQM. An open, cooperative culture has to be created by management. Employees have to be made to feel that they are responsible for customer satisfaction. They are not going to feel this if they are excluded from the development of visions, strategies, and plans. It's important they participate in these activities. They are unlikely to behave in a responsible way if they see management behaving irresponsibly - saying one thing and doing the opposite.

Product development in a TQM environment

Product development in a TQM environment is very different to product development in a non-TQM environment. Without a TQM approach, product development is usually carried on in a conflictual atmosphere where each department acts independently. Short-term results drive behaviour so scrap, changes, work-around, waste, and rework are normal practice. Management focuses on supervising individuals, and fire-fighting is necessary and rewarded.

Product development in a TQM environment is customer-driven and focused on quality. Teams are process-oriented, and interact with their internal customers to deliver the required results. Management's focus is on controlling the overall process, and rewarding teamwork
Objective of the Study:

Research Purpose and Objectives

The research focuses on the studying and analysing the present management education system and the designing a TQM model to enhance the quality of management education imparted and also the working of the institutes.

The main objectives of the proposed work to be carried out are as follows:

1. To assess the existing quality management practices in the institutes which impart management education.
2. To Design & develop a TQM system model to plug the gaps.
3. To implementation this model as a pilot study in one management institution and identify the factors affecting the working of the model to implement the same in other management institutions.
4. Generally, the purpose of this research is to identify the requirements for the implementation of TQM in SMK Taman Sri Andalas, Klang and to analysis each of these requirements and how those fit reality in the Colleges.

5. There are three objectives of the study as follows:
   1. To identify the leadership’s responsibilities of TQM in the following aspects:
      - Colleges performance
      - educational quality
   2. To identify the strategic planning undertaken by the Colleges in implementing TQM
   3. To examine relationship between the beneficiary satisfaction and quality service provided by Colleges

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