



# Total Quality Management

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# Total Quality Management

- **Course Title : Total Quality Management**
- **Semester : IV**
- **Code No. : 802**
- **Credit Hour : 3**

**Course Objective : This course aims to impart in graduates the basic conceptual knowledge about the concept of quality operations and its effects on overall business functions.**



# Syllabus

## **Unit I: Introduction**

Basic concept of total quality, its importance to business and customers, evolution of TQM, components and axioms of TQM, humanistic aspect of TQM, quality improvement teams at work places.

## **Unit II: Quality Plans Controls**

Conceptual approach to SQC, acceptance sampling and inspection plans, statistical process control, process capacity studies, management of QC and zero defect programs, Q-7 tools, quality audits, ISO 9000 series.

## **Unit III: Quality Costs and Maintenance**

Quality costs, Taguchi's loss function, maintenance and reliability, failure analysis, optimum maintenance decisions, total productive maintenance (TPM).

## **Unit IV: Marketing Aspect of Quality**

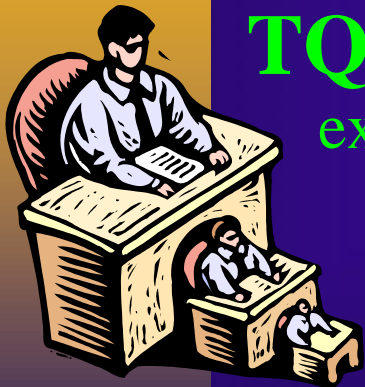
Total quality in services, total quality in business, total quality in safety; effect of TQ in economics of scale, mass marketing, and customer retention.




# Introduction

- ◆ **Total** – Made up of the whole(or) Complete.
- ◆ **Quality** – Degree of Excellence a product or service provides to the customer in present and future.
- ◆ **Management** – Act , art, or manner of handling , controlling, directing, etc.

**TQM** is the art of managing the whole to achieve excellence.





"TQM is a management approach for an organization, centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and to society."

### *Definition*

TQM is composed of three paradigms:

Total: Organization wide

Quality: With its usual Definitions, with all its complexities (External Definition)

Management: The system of managing with steps like Plan, Organise, Control, Lead, Staff, etc.



## Definition

**Total Quality Management (TQM)** is a management strategy aimed at embedding awareness of quality in all organizational processes.



## Explanation

TQM requires that the company maintain this quality standard in all aspects of its business.

This requires ensuring that things are done right the first time and that defects and waste are eliminated from operations.



# What is quality?

- ◆ It is a simple question, but with a not-so-simple answer.
- ◆ Oxford American Dictionary defines quality as “a degree or level of excellence.”
- ◆ American Society for Quality Control (ASQC) is “the totality of features and characteristics of a product or service that bears on its ability to satisfy given needs.”





# What is quality

- ◆ Garvin: “Quality is an unusually slippery concept, easy to visualize and yet frustratingly difficult to define.”
- ◆ Quality is defined as being about value (Feigenbaum, 1983)
- ◆ Quality is conformance to standards, specifications or requirements (Crosby, 1979)



# What is Quality?

- ◆ Quality is fitness for use (Juran, 1989)
- ◆ Quality as excellence (Peters and Waterman, 1982)
- ◆ Quality is concerned with meeting or exceeding customer expectations (Parasuraman et al., 1985)
- ◆ Quality means delighting the customer (Peters, 1989)



# Concept of Quality

- What does the term *quality mean*?
- *Quality is the ability of a product or service to consistently meet or exceed customer expectations.*



# Quality

- Quality is customer satisfaction.
- Quality is a relative term, generally used with reference to the end-use of the product or service.
- According to Edwards Deming, Quality should be aimed at the needs of customer, present and future.



# Quality

- ◆ Quality may be defined as “the sum of all characteristics and attributes of a certain product or service which make it acceptable to the people for whom it is meant.” Quality is an important factor for manufacturing or non manufacturing sector in profit making and non profit making organizations.



# Quality

- ◆ Good product quality doesn't occur by accident. It is the result of intelligent efforts. An organization must do series of work, each in perfection to achieve the desire quality. Products, whether goods or services are of good quality only if customer say they are. i.e. only if they meet the given specification and meet customer's needs and expectation.



# Quality

- ◆ Before second world war japans product was very poor
- ◆ After world war with the help of American consultant Deming and Juran, Japan started to make quality product with competitive priority.



# Quality

- ◆ Mid-1970 energy crisis created demand of fuel efficient Japanese car than large luxury cars.
- ◆ The quality practice by car industry spilled over into Japanese industries.





# Importance of TQM

- ◆ Why would a customer return to your organization if you do not deliver what you had promised him initially?
- ◆ You can fool someone once but not twice.
- ◆ Happy, satisfied customers become repeat customers and they provide word-of-mouth marketing – powerful advertisement.
- ◆ A primary focus of TQM is to improve customer satisfaction by having a customer focus and consistently meeting customer expectations.
- ◆ Customers are almost always satisfied when their expectations are met.



# Importance of TQM

- ◆ TQM provides the quality assurance that customers will get what they expect, as well as a process for managing unsatisfied customers, make needed corrections and prevent similar reoccurrences.
- ◆ Business research clearly shows that there is a direct correlation between satisfied customers and revenue.



# TQM implementation Benefits

Many firms in the world have arrived at the conclusion that effective TQM implementation can improve their competitive abilities and provide strategic advantages in the marketplace.

## Benefits of TQM implementation (Islam and Karim, 2010)

- improved quality,
- employee participation,
- teamwork,
- working relationship,
- customer satisfaction,
- employee satisfaction,
- productivity,
- communication,
- profitability, and
- market share

<b>Benefits</b>	<b>References</b>
<b>Reduced cost of operation</b>	<b>Oakland (1993), Hendriks and Singhal (1997), Holjevac (2008)</b>
<b>Improved employee involvement</b>	<b>Dale (1994), Antony et al. (2002), Lewis et al. (2005), Talib et al. (2010)</b>
<b>Improved communication</b>	<b>Anjard (1998), Antony et al. (2002), Lewis et al. (2005)</b>
<b>Increased productivity</b>	<b>Antony et al. (2002), Oakland (1989), Mohanty and Lakhe (1998), Samson and Terziovski (1999), Anderson et al. (1995)</b>
<b>Improved quality and less rework</b>	<b>Mohanty and Lakhe (1998), Antony et al. (2002), Reed et al. (1996)</b>
<b>Improved customer satisfaction</b>	<b>Antony et al. (2002), Anderson et al. (1995), Samson and Terziovski (1999), Reed et al. (1996), Talib et al. (2010c)</b>

<b>Benefits</b>	<b>References</b>
<b>Improved sustainable competitive advantage</b>	<b>Antony et al. (2002), Reed et al. (1996), Powell (1995), Holjevac (2008)</b>
<b>Innovation</b>	<b>Bounds et al. (1994), Talib et al. (2010)</b>
<b>Enhanced customer service and loyalty</b>	<b>Samson and Terziovski (1999), Reed et al. (1996), Anderson et al. (1995)</b>
<b>Improved organizational management</b>	<b>Oakland (1989), Samson and Terziovski (1999), Kumar et al. (2011)</b>
<b>Improved employee relations and satisfaction</b>	<b>Samson and Terziovski (1999), Anderson et al. (1995), Holjevac (2008)</b>
<b>Improved financial performance</b>	<b>Reed et al. (1996), Salaheldin (2009), Christensen (1995), Hendriks and Singhal (1997), Talib et al. (2010)</b>
<b>Improved process and performance</b>	<b>Lewis et al. (2005), Hendriks and Singhal (1997)</b>



# Research Output

- ◆ Rategan (2012) indicated that 90% improvement rate in employee relations, operating procedures, customer satisfaction, and financial performance is achieved due to TQM implementation (Becker, 2001)
- ◆ Talib et al (2010) stated that implementation of TQM improves the performance of a company.
- ◆ If TQM practices are implemented effectively, more quality benefits will be achieved (Sajjad & Amjad, 2012).



# Research Output

- ◆ Sila (2014), TQM can minimize the total cost of production by limiting the number of suppliers used by the firm and providing them with necessary training and technology.



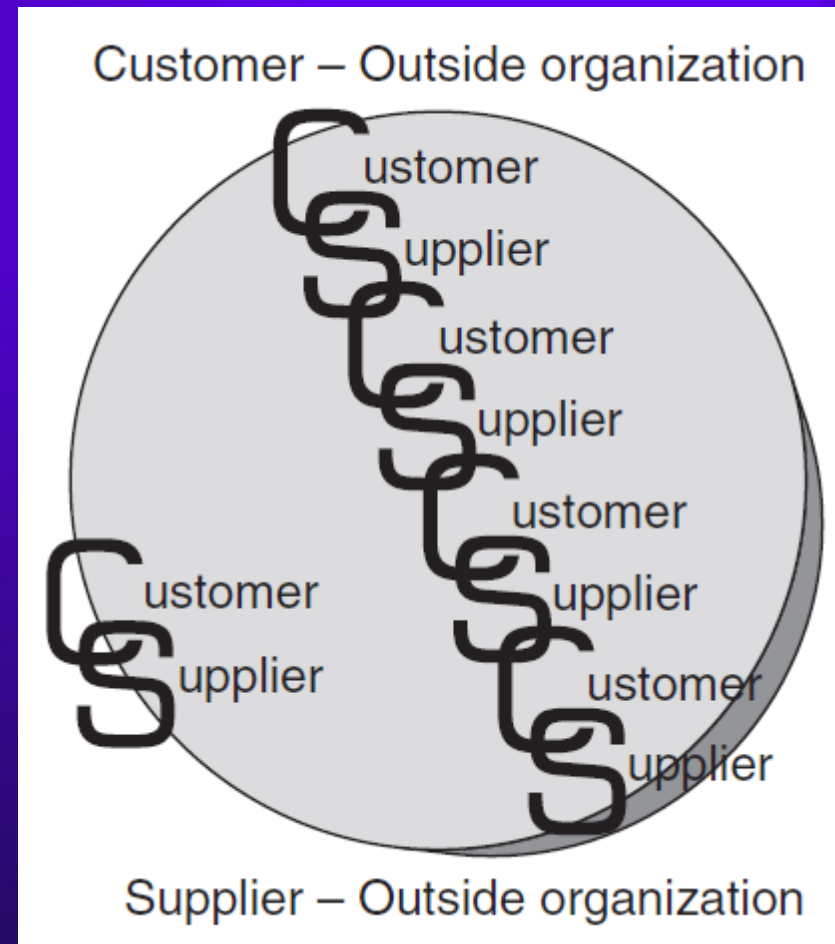
# Benefit to Customer

- ◆ TQM focuses on using high quality information to improve processes reduces waste and saves time, leading to reduced expenses that can be passed along to clients in the form of lower prices.
- ◆ TQM are able to reduce variability, providing the consistent product and service. This creates customer loyalty and earns their continued business.

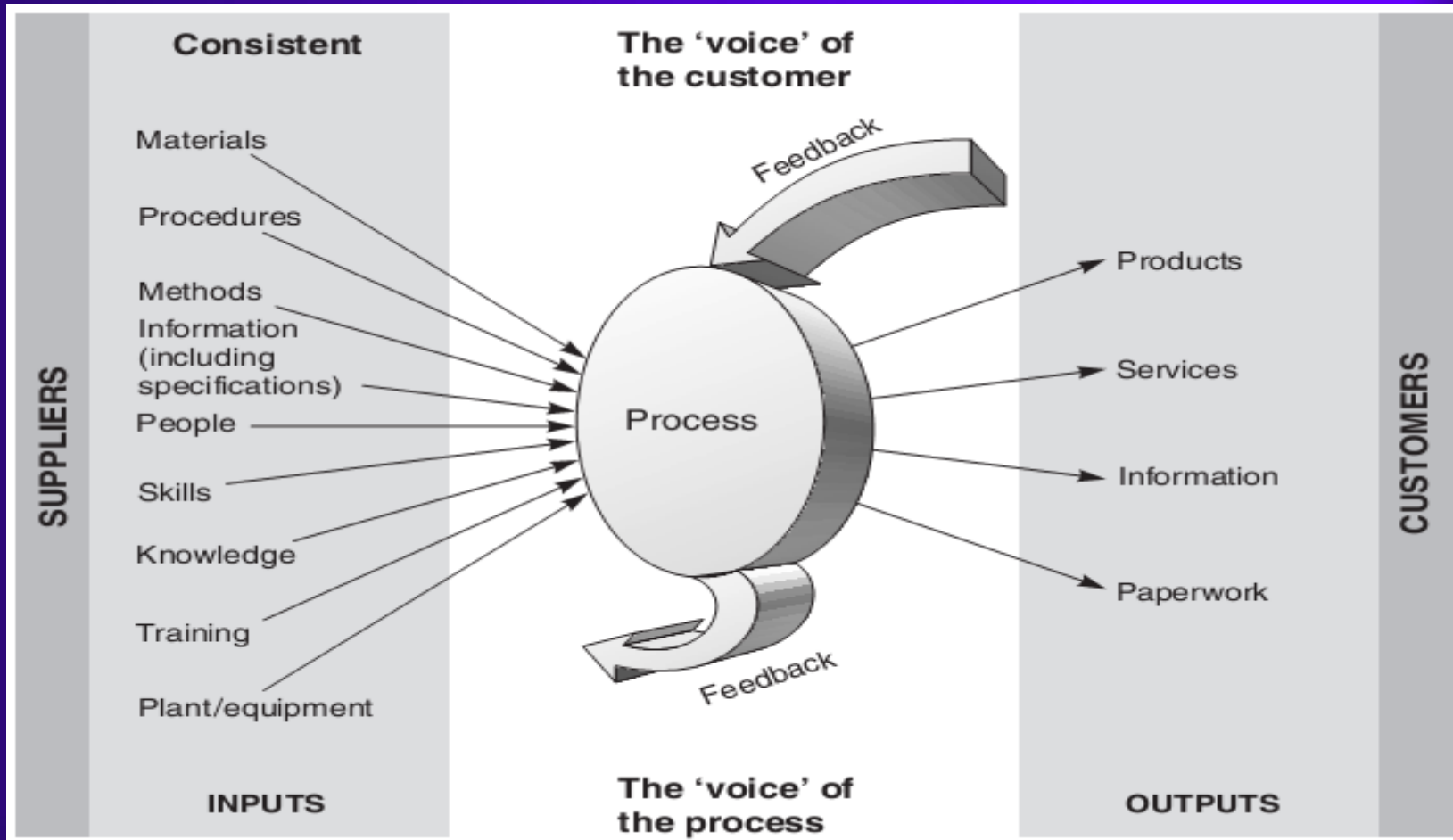


# Understanding and Building the Quality

customers are the  
valuable assets  
Concept of internal  
& external customer



# Quality and process





# Quality in all function.

For an organization to be truly effective, each component of it must work properly together. Each part, each activity, each person in the organization affects and is in turn affected by others. Errors have a way of multiplying, and failure to meet the requirements in one part or area creates problems elsewhere, leading to yet more errors, yet more problems, and so on.



◆ Managements that rely heavily on exhortation of the workforce to ‘do the right job right the first time’, or ‘accept that quality is your responsibility’, will not only fail to achieve quality but may create division and conflict. These calls for improvement infer that faults are caused only by the workforce and that problems are departmental or functional when, in fact, the opposite is true – most problems are interdepartmental. The commitment of all members of an organization is a requirement of ‘organization-wide quality improvement’. Everyone must work together at every interface to achieve improved performance and that can only happen if the top management is really committed.



# Concept of customer satisfaction

- ◆ A customer is one who purchase a product or get service from organization.
- ◆ Organization cannot survive without satisfying customer.
- ◆ Satisfaction is a person's feelings of pleasure or disappointment resulting comparing a product's or service's perceived performance in relation to his or her expectations.



# Identifying external customer needs

- ◆ By discussing their needs with them
- ◆ By asking for customer feedback
- ◆ By analyzing complains
- ◆ Through staff feedback
- ◆ Carrying out market research
- ◆ Through customer surveys
- ◆ Through questionnaires
- ◆ Through customer audits
- ◆ Through attitude surveys



# Customer Satisfaction Process

- ◆ Understanding Customer Expectations
- ◆ Promises to Customers
- ◆ Execution
- ◆ Ongoing Dialog with a Customer
- ◆ Customer Satisfaction Surveys



# Cost of quality

- ◆ Failure Cost: Costs incurred by defective parts/products or faulty services.
- ◆ Internal failure costs: The cost incurred to fix problems that are detected before the product/service is delivered to the customer.
- ◆ External failure costs: All costs incurred to fix problems that are detected after the product/service is delivered to the customer.





# Cost of Quality (continued)

- ◆ Appraisal costs: Cost of activities designed to insure quality or uncover defects.
- ◆ Prevention costs: All Quality training, Quality planning, customer assessment, process control cost and quality improvement cost to prevent defects from occurring.



# Customer Retention

- ◆ Customer retention is the activities the produces customer satisfaction which creates the loyalty of customer.

# Evolution of TQM



# Quality Journey



Inspection  
Before 1950

Quality Control  
(1950-1970)

Total Quality  
Management  
1990+

Quality  
Assurance  
(1970 – 1990)

Characteristics	Inspection	Quality Control	Quality Assurance	TQM
Primary concern	Detection	Control	Coordination	Management
View of Quality	A Problem	To be solved	Proactive attack	A competitive opportunity
Emphasis	Product uniformity	Uniform product with less inspection	Designers role	The market and consumer needs
Methods	Testing, measurement	Statistical quality tools	Programs and systems	Strategic planning, goal setting
Who is responsible	Inspection dept.	Manufacturing and engineering departments	All Departments	Every (Team) one in the organization
Orientation & approach	Inspects quality	Controls quality	Builds in quality	Manages in quality

# Guru's of TQM

- ◆ Walter.A.Shewhart -TQC
- ◆ W.Edwards Deming- 14 Points & PDCA
- ◆ Joseph.M.Juran-Juran's Trilogy and Ten steps
- ◆ A.Feiganbaum- Customer requirement, Employee Involvement, TQC.





# TQM concept from Quality Gurus

## ◆ Edward Deming

- Father of Quality Management
- PhD in physics
- keen statistician
- US government in the department of Agriculture and the Bureau of Census
- 1950, Japan, Course on Quality Control
- Japanese embraced the notion of quality under Deming's inspiration.



# Deming

- ◆ Deming believes in continuous improvement. He also believes that the consumer is the most important part of a production line. Meeting and exceeding the customers' requirements is the task that everyone within the organization needs to accomplish with total commitment. Furthermore, Deming believes in the use of statistical process control (SPC) charts as major method for solving problems.





# Deming's Fourteen Points

1. Create constancy of purpose to improve products and services
2. Adopt a new philosophy for the new economic age, with management learning what their responsibilities are and assuming leadership for change
3. Cease dependence on mass inspection to achieve quality, by building quality into the product



# Deming's Fourteen Points

4. End the awarding of business on price; award business on total cost and move towards single suppliers
5. Improve constantly and forever the system of production and service
6. Institute training on the job
7. Institute leadership with the aim of supervising people to help them to do better job.



# Deming's Fourteen Points

8. Drive out fear so that everyone can work effectively together for the organization
9. Break down barriers between departments. Encourage research, design, sales and production to work together to foresee difficulties belong to the whole system
10. Eliminate slogans, exhortations and numerical targets for the workforce since they are divisive, given that difficulties belong to the whole system



# Deming's Fourteen Points

11. Eliminate quotas or work standards and management by objectives or numerical goals; leadership should be substituted instead
12. Remove barriers that rob people of their right to pride in their work
13. Encourage education and self-improvement for everyone
14. Take action to accomplish the transformation



# Joseph M. Juran

- ◆ 1924, Engineer
- ◆ Worked as civil servant, executive,, academic, arbitrator, director and management consultant.
- ◆ Quality Control Handbook
- ◆ 1950 Movement of Quality in Japan



# Quality Trigology

Quality Trilogy	Definition
<i>Quality planning</i>	<i>The activity of developing the products and processes required to meet customers' needs.</i>
<i>Quality control</i>	<i>This process deals with execution of plans, conducting operations to meet the goals</i>
<i>Quality improvement</i>	<i>This process is the means of raising quality performance to unprecedented level.</i>



# Juran's Ten Steps

1. Build awareness of the need and opportunity for improvement.
2. Set goals for improvement.
3. Organize to reach the goals (establish a quality council, identify problems, select projects, appoint teams, designate facilitators).
4. Provide training.
5. Carry out projects to solve problems.



# Juran's Ten Steps

6. Report progress.
7. Give recognition.
8. Communicate results.
9. Keep score
10. Maintain momentum by making annual improvement part of the regular systems and processes of the company.





# Philip B. Crosby

- ◆ Graduate of the Western Reserve University
- ◆ After military service
- ◆ Quality control in manufacturing,
- ◆ Line inspector to quality director
- ◆ Philip Crosby Associates Incorporated and the Quality College based in Florida.



# Four Absolute

First Absolute :	The definition of quality is conformance to requirements, not goodness.
Second Absolute :	The system for causing quality is preventive, not appraisal.
Third Absolute	The performance standard must be zero defect, not “that’s close enough”.
Fourth Absolute :	The measurement of quality is the price of non – conformance, not indexes



# Crosby's Fourteen Steps

Step 1 : Establish and ensure management commitment. It is vital that the whole management team participate in the programme.

Step 2 : Form quality improvement teams (QITs) for quality improvement process planning and administration. The emphasis here is on multidisciplinary team effort. An initiative from the quality department will not be successful. It is essential to build team working across arbitrary; and often artificial, organizational boundaries.



# Crosby's Fourteen Steps

Step 3 : Establish quality measurements. These must apply to every activity throughout the company. A way must be found to capture every aspect, design, manufacturing, delivery, and so on. These measurements provide a platform for the next step.

Step 4 : Evaluate the cost of quality and explain its use as a management tool to measure waste. This evaluation must highlight, using the measures established in the previous step, where quality improvement will be profitable.



# Crosby's Fourteen Steps

Step 5 : Raise quality awareness among all employees. This is normally undertaken through the training of managers and supervisors, through communications such as videos and books, and by displays and posters.

Step 6 : Take actions to correct problems identified through previous steps. This involves encouraging staff to identify and rectify defects, or pass them on to higher supervisory levels where they can be addressed.



# Crosby's Fourteen Steps

Step 7 : Establish a zero defects committee and programme. This is done by establishing a committee or working group to develop ways to initiate and implement a zero defects programme.

Step 8 : Train supervisors and managers on their role and responsibilities in the quality improvement process. This step is focused on achieving understanding by all managers and supervisors of the steps in the quality improvement programme in order that they can explain these in turn.



# Crosby's Fourteen Steps

Step 9 : Hold a zero defects day to reaffirm management commitment. This can be achieved in a celebratory atmosphere.

Step 10: Encourage individuals and groups to set improvement goals. Goals are of course of no value unless they are related to an appropriate timescale for their achievement.

Step 11: Obstacle reporting (i.e., encourage employees to communicate to management any obstacles they take in attaining their improvement goals).



# Crosby's Fourteen Steps

Step 12: Recognize and appreciate all participants.

Step 13: Establish quality councils to discuss quality matters on a regular basis. These are essentially forums composed of quality professionals and team leaders allowing them to communicate and determine action plans for further quality improvement.

Step 14: Do it all over again to demonstrate that the improvement process never ends.

Achievement of quality is an ongoing process. There is always further to go.





# Armand V. Feigenbaum

- ◆ concept of Total Quality Control (**TQC**).
- ◆ His book “**Total Quality Control**” was first published in 1951
- ◆ quality as a **strategic business tool** that requires involvement from everyone
- ◆ quality control as a **measurement and evaluated tool**.
- ◆ Quality begins with identification of **customers requirements** and ends with a product or service in the hands of **a satisfied customer**.



# Ten attributes of Feigenbaum

1. Total Quality control must be a company-wide process. It is a system for integrating quality **development, maintenance and improvements** efforts in an organization that will **enable engineering, marketing, production and service** to function at optimal economic levels while achieving **customer** satisfaction.
2. Quality is defined by the customer.



# Ten attributes of Feigenbaum

3. **Quality and cost is a sum**, not a difference. Operating quality costs can be divided into four categories: prevention costs, appraisal costs, internal failure cost and external failure costs.
4. Quality requires both individual and team enthusiasm.
5. Quality is a way of managing.
6. Quality and innovation are interdependent.



# Ten attributes of Feigenbaum

7. Quality is an ethic.
8. Enhanced quality demands continuous improvement.
9. Quality is the most cost-effective and least capital-intensive route to productivity.
10. Quality is implemented with a total system connected with customers and suppliers.



# Components of TQM

- ◆ *Top management commitment & involvement,*
- ◆ *Policy deployment,*
- ◆ *Process control and improvement,*
- ◆ *Research and development,*
- ◆ *training and education,*
- ◆ *suppliers' relationship,*
- ◆ *customer relationship,*
- ◆ *employee empowerment and involvement, and*
- ◆ *evaluation and assessment.*



# Axioms of TQM

- ◆ Commitment to Quality
- ◆ Total Involvement
- ◆ Continuous Improvement
- ◆ Extensive use of Scientific tools & techniques



# Humanistic aspect of TQM

- ◆ The secret of Toyota is the workforce – the team members in the production line, the suppliers, the engineers, everyone who handle production – having an attitude that they are making world class vehicles.
- ◆ Deming emphasized that no organization can survive without good people, who are improving all time.
- ◆ The human resource is only the component which competitors cannot copy.



# Humanistic aspects

- ◆ Integrating HR plans with overall plan
- ◆ Involvement of employees
- ◆ Suggestion and recognition system
- ◆ Focusing on team
- ◆ Empowering HR
- ◆ Training and Education
- ◆ Monitoring and Measurement
- ◆ Customer employee satisfaction





# Quality improvement teams at work places.

- ◆ A team is a small number of people with complementary skills, who are committed to a common purpose, set of performance goals.
- ◆ Teams may perform a variety of problem activities such as
  - Identifying customer needs
  - Brainstorming to discover opportunity for improvement
  - Recommendation of corrective actions

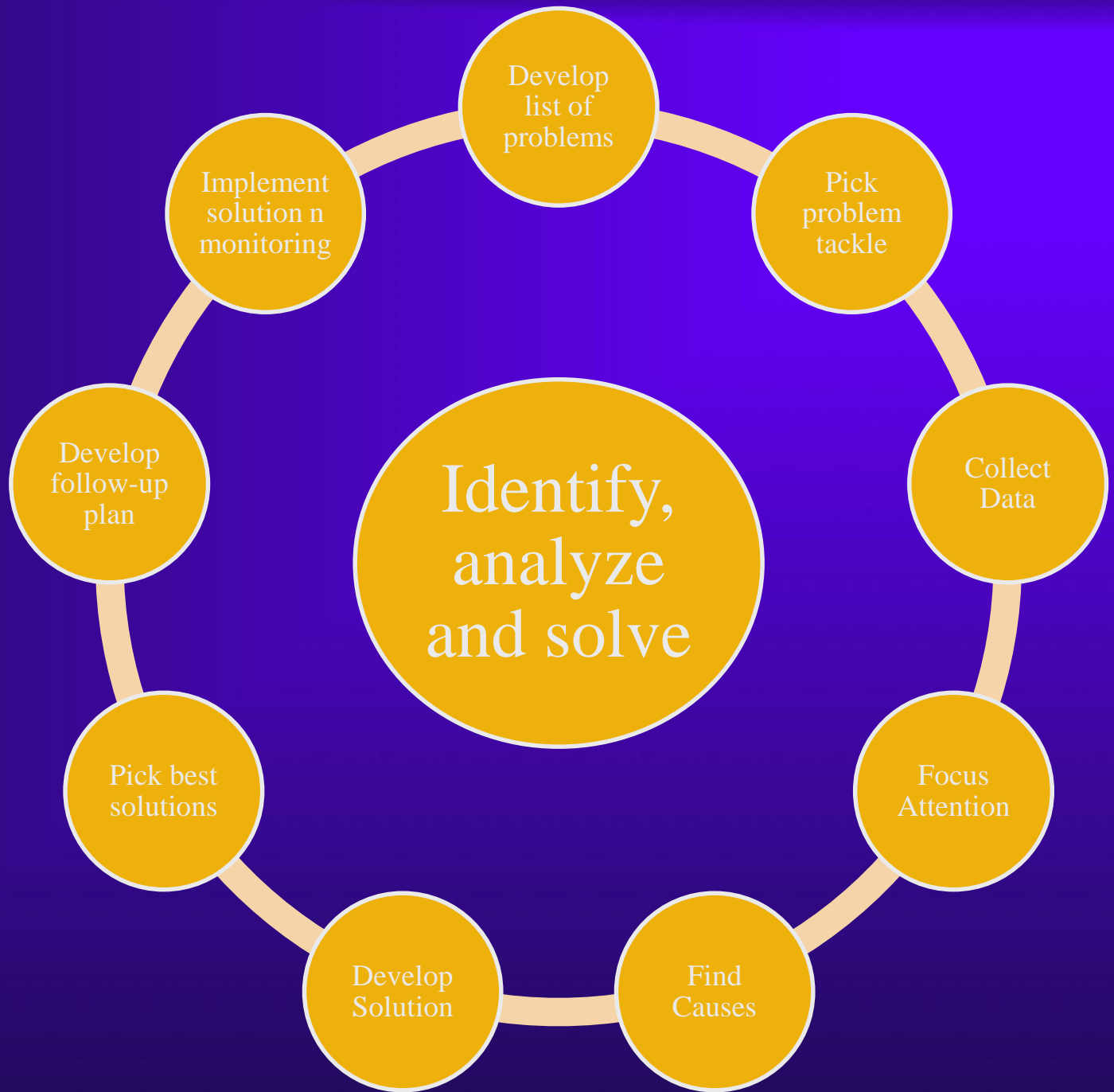


# Types of team

- ◆ Quality Circle
- ◆ Problem solving teams
- ◆ Management teams
- ◆ Work team
- ◆ Project team
- ◆ Virtual team



# Function of Team





# Characteristics of Effective Team



