



TOTAL QUALITY MANAGEMENT

Course Outcomes

1. Explain the various approaches of TQM
2. Infer the customer perception of quality
3. Analyze customer needs and perceptions to design feedback systems.
4. Apply statistical tools for continuous improvement of systems.
5. Apply the tools and technique for effective implementation of TQM.



INTRODUCTION

Total Quality Management

- Total – Everything
- Quality – Degree of excellence
- Management – art, act or way of organizing, controlling, planning, directing to achieve certain goals

Therefore, TQM is the art of managing the whole to achieve excellence

Some definitions that are accepted in various organizations:

- “Quality is customer satisfaction,”
- “Quality is Fitness for Use.”

Who is a customer?

Anyone who is impacted by the product or process delivered by an organization.

External customer:

The end user as well as intermediate processors. Other external customers may not be purchasers but may have some connection with the product.

Internal customer:

Other divisions of the company that receive the processed product.

What is a product?

The **output of the process** carried out by the organization. It may be

- Goods (e.g. automobiles, missile),
- Software (e.g. a computer code, a report)
- Service (e.g. banking, insurance)

Why Quality?

- Competition
- Changing customer
- Changing product mix
- Product complexity
- Higher levels of customer satisfaction

Quality perspectives

1. Perfection
2. Consistency
3. Eliminating waste
4. Speed of delivery
5. Compliance with policies and procedures
6. Doing it right the first time
7. Delighting or pleasing customers
8. Total customer satisfaction and service

BASIC CONCEPT OF TQM (BASIC APPROACH)

1. A committed and involved management to provide long term, top to bottom organizational support.
2. An un – wavering focus on the customer both internally and externally.
3. Effective involvement and utilization of entire workforce.
4. Continuous improvement of the business and production process.
5. Treating suppliers as partner
6. Establishing performance measures for the process.

CHARACTERISTICS

- Customer Oriented
- Long term commitment for continuous improvement of all process
- Team work
- Continuous involvement of top management
- Continuous improving at all levels and all areas of responsibility

PRINCIPLES OF TQM:

- Customers requirements - (both internal & external) must be met first time & every time Everybody must be involved
- Regular two way communication must be promoted
- Identify the training needs and supply it to the employees
- Top management commitment is must
- Every job must add value
- Eliminate waste & reduce total cost
- Promote creativity
- Focus on team work.

Gurus of TQM

- Quality Gurus- Individuals who have been identified as making a significant contribution to improving the quality of goods and services.
 - Walter A. Shewhart
 - W. Edwards Deming
 - Joseph M. Juran
 - Armand Feigenbaum
 - Philip Crosby
 - Genichi Taguchi
 - Kaoru Ishikawa

Gurus of TQM

SHEWHART

- Control chart theory
- PDCA Cycle

DEMING

- Statistical Process Control

JURAN

Concepts of SHEWHART

- Return on Investment (ROI)

FEIGANBAUM

- Total Quality Control
- Management involvement
- Employee involvement
- Company wide quality control

ISHIKAWA

- Cause and Effect Diagram
- Quality Circle concept

CROSBY

- “Quality is Free”
- Conformance to requirements

TAGUCHI

- Loss Function concept
- Design of Experiment

Gurus of TQM

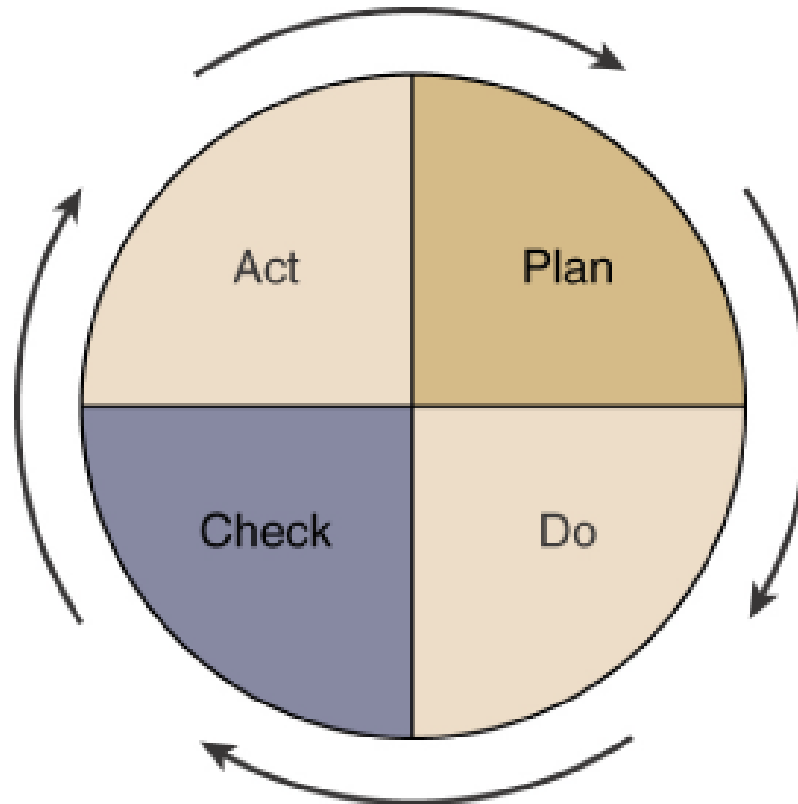


- **Walter A. Shewhart**

- Developed statistical control process methods to distinguish between random and nonrandom variation in industrial processes to keep processes under control.
- Developed the “plan-do-check-act” (PDCA) cycle that emphasizes the need for continuous improvement.
- Strongly influenced Deming and Juran

Gurus of TQM

Shewhart's Plan-Do-Check-Act (PDCA) Cycle



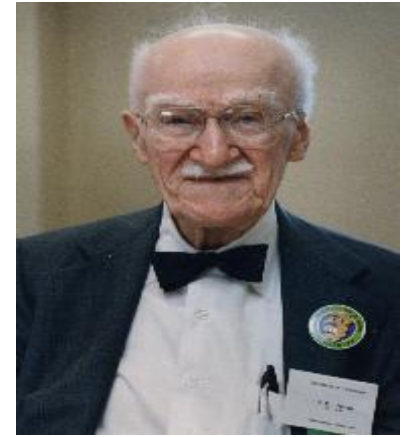
Gurus of TQM

● **W. Edwards Deming**



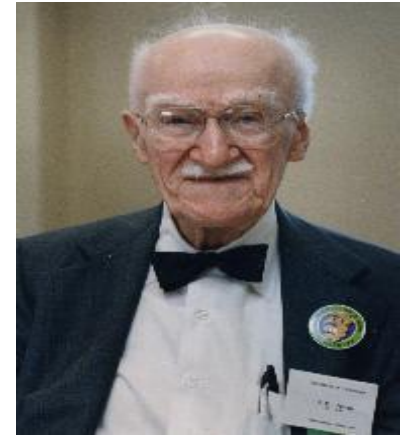
- Advocated Statistical Process Control (SPC)
 - Methods which signal shifts in a process that will likely lead to products and/or services not meeting customer requirements.
 - Emphasized an overall organizational approach to managing quality.
 - Demonstrated that quality products are less costly than poor quality products.
 - Identified 14 points critical for improving quality.

Gurus of TQM



- **Joseph M. Juran**
 - Emphasized the importance of producing quality products through an approach focused on quality planning, control, and improvement.
 - Defined product quality as “fitness for use” as viewed by the customer
 - Categorized the cost of quality as:
 - Cost of prevention
 - Cost of detection/appraisal
 - Cost of failure

Gurus of TQM



- **Joseph M. Juran**
- Quality Trilogy
 1. *Quality planning*: Process of preparing to meet quality goals. Involves understanding customer needs and developing product features.
 2. *Quality control*: Process of meeting quality goals during operations. Control parameters. Measuring the deviation and taking action.
 3. *Quality improvement*: Process for breaking through to unprecedented levels of performance. Identify areas of improvement and get the right people to bring about the change.

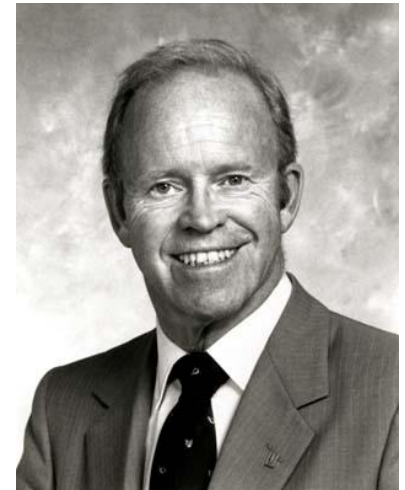
Gurus of TQM



- **Armand Feigenbaum**

- Proposed the concept of “total quality control,” making quality everyone’s responsibility.
 - Stressed interdepartmental communication.
 - Emphasized careful measurement and report of quality costs

Gurus of TQM



- **Philip Crosby**

- Preached that “quality is free.”
- Believed that an organization can reduce overall costs by improving the overall quality of its processes.

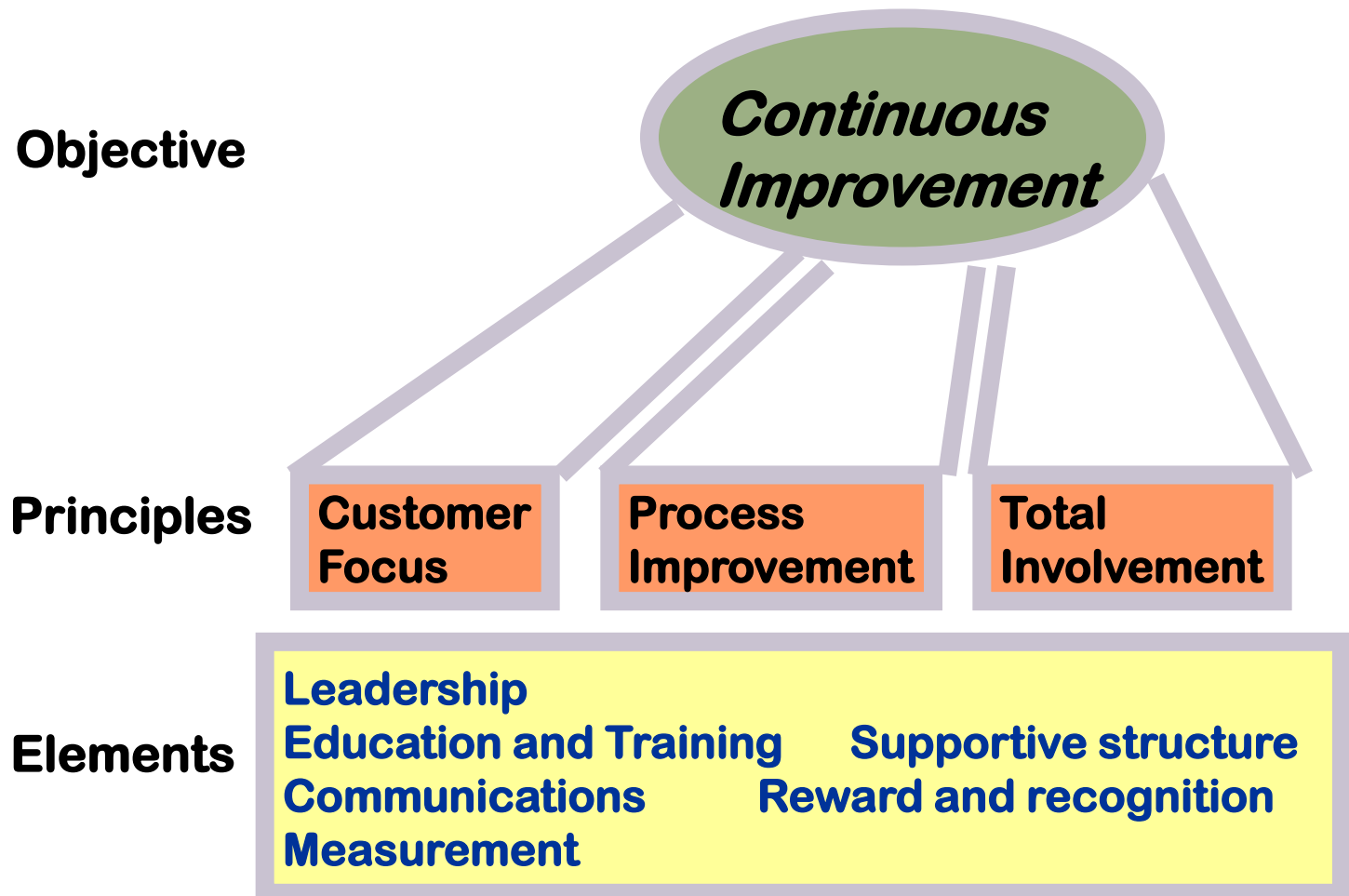
Gurus of TQM



- **Genichi Taguchi**

- Emphasized the minimization of variation.
- Concerned with the cost of quality to society.
- Extended Juran's concept of external failure.

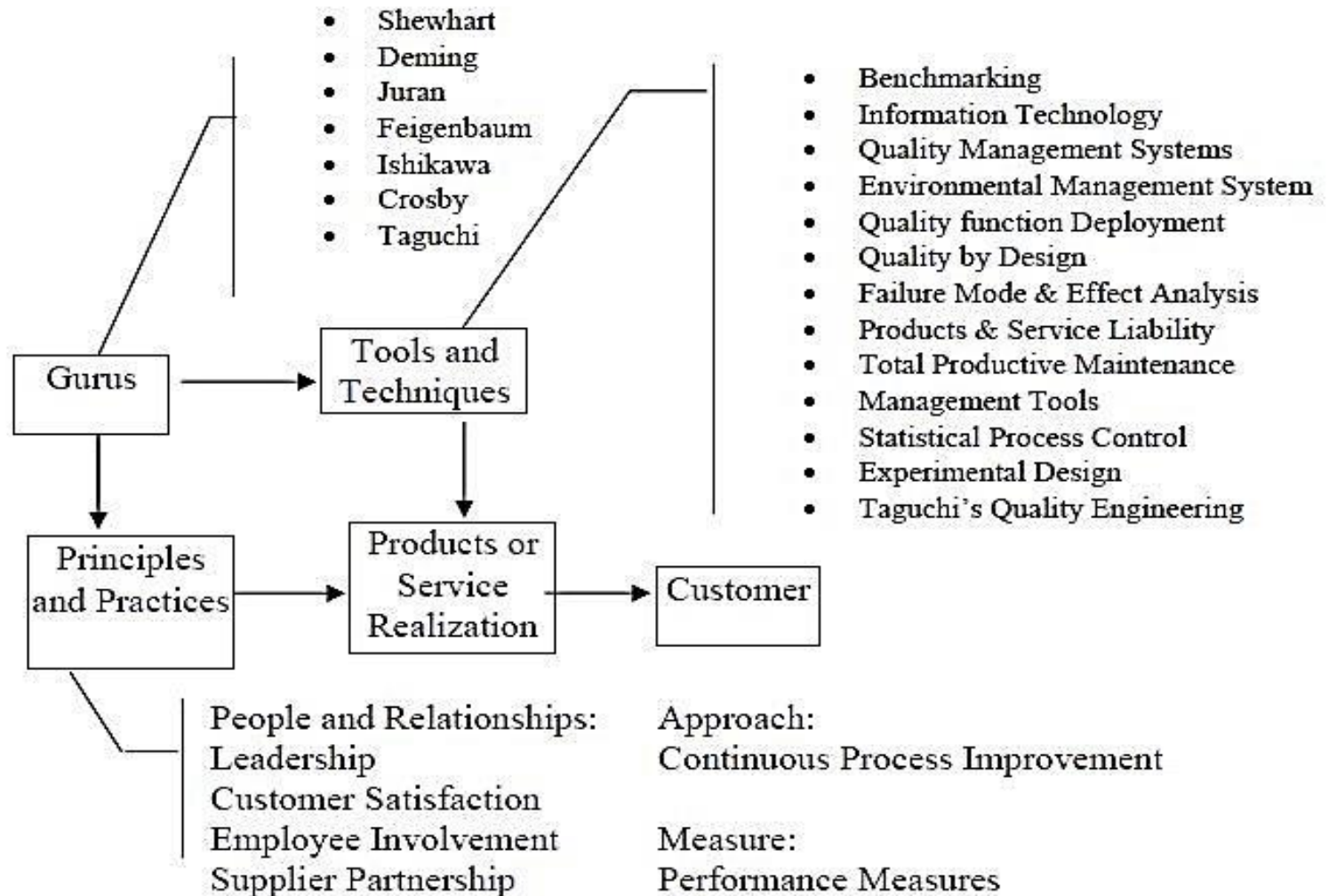
Total Quality Management



Total Quality Management

Quality element	Previous state	TQM
Definition	Product-oriented	Customer-oriented
Priorities	Second to service and cost	First among equals of service and cost
Decisions	Short-term	Long-term
Emphasis	Detection	Prevention
Errors	Operations	System
Responsibility	Quality Control	Everyone
Problem solving	Managers	Teams
Procurement	Price	Life-cycle costs
Manager's role	Plan, assign, control, and enforce	Delegate, coach, facilitate, and mentor

TQM Framework



HISTORICAL REVIEW

1920s

- Some of the first seeds of quality management were planted as the principles of scientific management swept through U.S. industry.
- Businesses clearly separated the processes of planning and carrying out the plan, and union opposition arose as workers were deprived of a voice in the conditions and functions of their work.
- The Hawthorne experiments in the late 1920s showed how worker productivity could be impacted by participation.

1930s

- In 1942 W.A. Shewhart of Bell Telephone Laboratories developed a statistical chart for the control of product variables. This is beginning of SQC
- In some decade H.F. Dodge and H.G. Romig both of Bell telephone laboratories developed the area of acceptance sampling as a substitute for 100% inspection. It is recognized by 1942.
- In 1946 the American society for Quality Control was formed. Now it is American Society for Quality

HISTORICAL REVIEW

1950s

- In 1950 W. Edwards Deming who learned SQC from shewhart, gave a series of lectures on statistical methods to Japanese Engineers and Executives.
- Un 1954 Joseph M. Juran made his first trip to Japan taught the concepts of controlling quality and managerial breakthrough and further he emphasized management's responsibility to achieve quality..
- Armand V. Feigenbaum's book Total Quality Control, a forerunner for the present understanding of TQM, was published.
- Philip B. Crosby's promotion of zero defects paved the way for quality improvement in many companies.

1968

- The Japanese named their approach to total quality companywide quality control.
- Kaoru Ishikawa's synthesis of the philosophy contributed to Japan's ascendancy as a quality leader.
- By 1970's and 80's U.S. managers were making frequent trips to Japan to learn about the Japanese miracle.
- In 1980's the automotive industry began to emphasizes statistical process control (SQC)

Today

- TQM is the name for the philosophy of a broad and systemic approach to managing organizational quality.
- Quality standards such as the ISO 9000 series and quality award programs such as the Deming Prize and the Malcolm Baldrige National Quality Award specify principles and processes that comprise TQM.

QUALITY – DEFINITION

- Predictable degree of uniformity and dependability at low cost and suited to the market - **Deming**
- Fitness for use-**Juran**
- Conformance to requirements - **Crosby**
- Minimum loss imparted by a product to society from the time the product is shipped - **Taguchi**
- A way of managing tile organization - **Feigenbaum**
- Correcting and preventing loss, not living with loss - **Hosffin**
- The totality of characteristics of an entity that bear on its ability to satisfy stated and implied needs – **ISO**

Quality is defined as follows

$$Q = \frac{P}{E}$$

P = Performance E = Expectations

BARRIERS OF TQM(obstacles)

- ⊕ Lack of Management Commitment
- ⊕ Inability to change organizational Culture
- ⊕ Improper Planning
- ⊕ Lack of continuous training and education
- ⊕ Incompatible Organizational Structure and Isolated Individuals and Departments.
- ⊕ Ineffective Measurement Techniques and Lack of Access to Data and Results.
- ⊕ Paying Inadequate Attention to Internal and External Customers
- ⊕ Inadequate Use of Empowerment and Teamwork
- ⊕ Failure to Continually Improve

BENEFITS OF TQM

- **Tangible Benefits**

- Improved product quality
- Improved productivity
- Reduced quality costs
- Increased market and customers
- Increased profitability
- Reduced employee grievances

- **Intangible Benefits**

- Improved employee participation
- Improved team work
- Improved working relationships
- Improved customer satisfaction
- Improved communication
- Enhancement of job interest
- Enhanced problem solving capacity
- Better company image

Quality Management System(QMS)

- A Quality Management System (QMS) is a system that defines operations to achieve consistency and creditability with customers
- QMS refers to what the organization does to manage its processes, or activities in order that the products or services that it produces meet the objectives it has set itself (ISO, 2004)
 - ISO 9000 series (International Standards Organization standard on quality management)

ISO 9000

- The International Organization for Standardization (ISO)
- ISO 9000 Series of Quality Standards
 - An international set of standards for documenting the processes that an organization uses to produce its goods and services.

ISO 9000:2000	Quality Management Systems: Fundamentals and Standards
ISO 9001:2000	Quality Management Systems: Requirements
ISO 9004:2000	Quality Management Systems: Guidelines for Performance Improvement

ISO 9000: 2000

Created to meet five objectives:

1. Achieve, maintain, and seek to continuously improve product quality in relation to the requirements.
2. Improve the quality of operations to continually meet customers' and stakeholders' needs.
3. Provide confidence to internal management that quality requirements are being met
4. Provide confidence to the customers that quality requirements are being met.
5. Provide confidence that quality system requirements are fulfilled.

Structure of ISO Quality standards

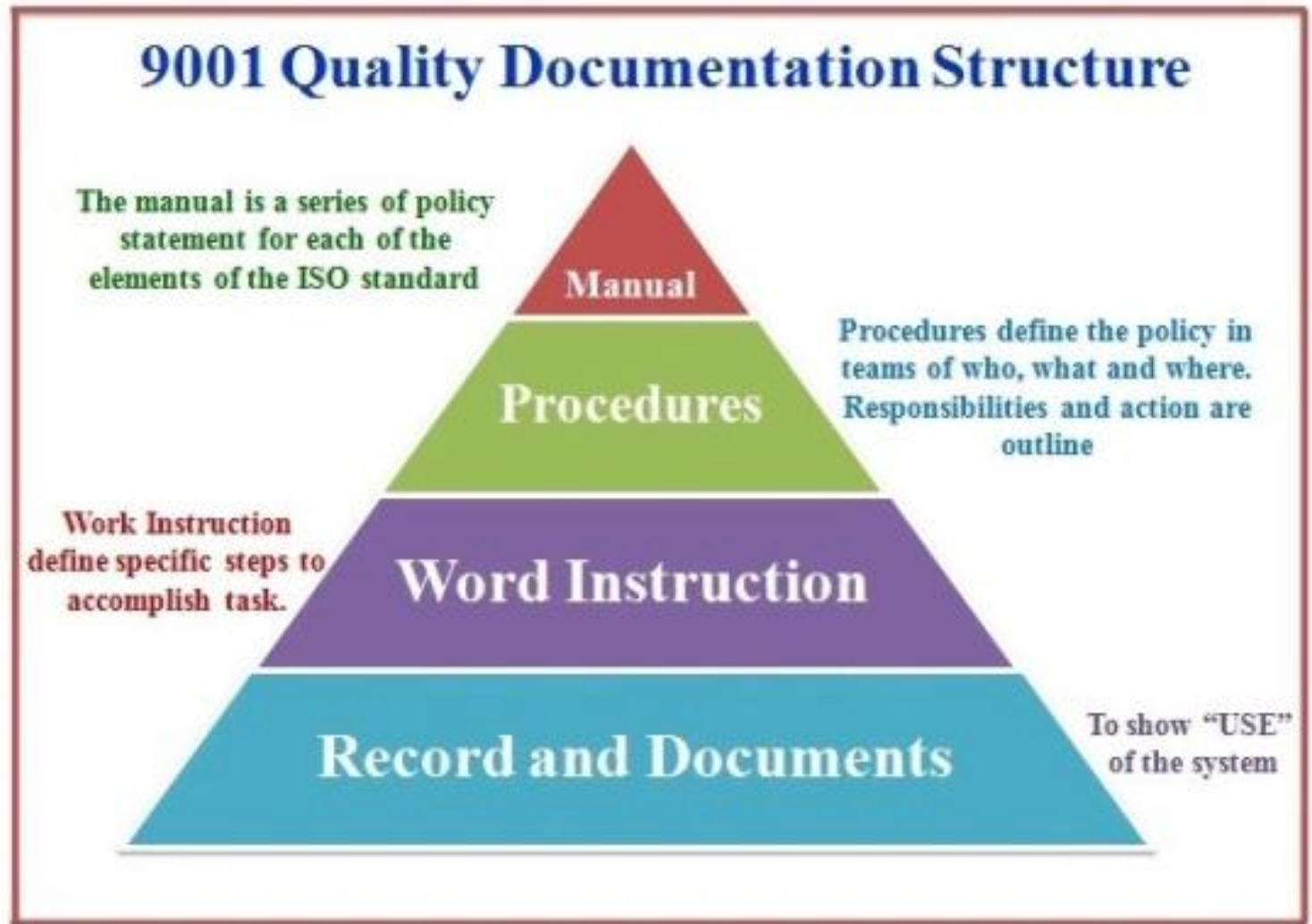
ISO 9000 series

ISO 9000:2000	Fundamentals and vocabulary
ISO 9001:2000	Requirement standards used for Registration
ISO 9004:2000	Guidelines for performance improvements
ISO 9002:2000	Guidelines for Production & Installation and servicing of products & services
ISO 9003:2000	Guidelines for Final Inspection and Testing

Implementation of ISO 9000

1. Top Management Commitment
2. Appointment of Management Representative
3. Awareness
4. Appointment of implementation team
5. Training
6. Time Schedule
7. Selection of Element owners
8. Review of current system
9. Writing of Documents
10. Installing of New system
11. Internal Audit
12. Management Review
13. Reassessment
14. Registration

Documentation of ISO 9000



Documentation of ISO 9000

I Level	Policy	What do we do? Why?	Policy Objectives Stated once
II Level	Procedures	Who? When? Where?	Calibration QA Procedures Audit Processes
III Level	Work Instructions or Practices, Technical Data	How?	Work Instructions, Inspection Instructions, Standard Operating Practices, Drawings, Specifications, Standards
IV Level	Records or Proof		Evidence-;all the records and forms which are generated by the working system.

