



# **SNS COLLEGE OF ENGINEERING**

Kurumbapalayam (Po), Coimbatore – 641 107



## **An Autonomous Institution**

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A' Grade  
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

## **DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY**

**COURSE NAME : 190E114 TOTAL QUALITY MANAGEMENT**

**III YEAR / VI SEMESTER**

**Unit 1- INTRODUCTION**

**Topic : INTRODUCTION**



## Introduction to TQM

### What is TQM?

Total Quality Management (TQM) is an organizational philosophy and approach focused on improving the quality of products, services, and processes. It aims to foster a culture of continuous improvement, aiming for customer satisfaction and overall organizational effectiveness.

### Key Concepts of TQM:

**Quality:** Meeting or exceeding customer expectations consistently.

**Continuous Improvement:** Incremental improvements in all organizational processes.

**Employee Involvement:** Engaging everyone in the organization to contribute to quality enhancement.



## Key Principles of TQM

- 1. Customer Focus:** Quality management starts with understanding and meeting customer needs. Satisfied customers are more likely to return and recommend services or products.
- 2. Total Employee Involvement:** Employees at all levels should be involved in decision-making, quality improvement, and problem-solving. Training and empowerment are crucial for fostering ownership and responsibility.
- 3. Process Approach:** TQM stresses the importance of managing and improving processes, rather than just focusing on the outcome. A well-designed process leads to better quality.



## Key Principles of TQM

- 4. Integrated System:** All departments, from production to customer service, must work cohesively to maintain high-quality standards. The success of one department impacts the entire organization.
- 5. Continuous Improvement:** Organizations should never be satisfied with the current state. TQM promotes a culture of ongoing improvement, aiming to optimize efficiency, reduce waste, and improve processes.
- 6. Data-Driven Decision Making:** Decisions should be based on accurate data, not assumptions. Statistical tools and techniques like control charts, histograms, and root cause analysis are integral to TQM.



## Tools and Techniques Used in TQM

### 1. Pareto Analysis (80/20 Rule):

Identifies the most critical issues that, when addressed, will yield the greatest improvement. It helps prioritize actions based on the impact.

**Example:** 80% of defects come from 20% of causes.

### 2. Fishbone Diagram (Ishikawa):

Helps identify the root causes of a problem by categorizing potential sources of issues (e.g., materials, methods, machines, people).

**Example:** A production issue might be traced to faulty equipment or lack of proper training.



## Tools and Techniques Used in TQM

### 3. Control Charts:

Used to monitor the consistency of processes over time. It helps identify trends, variations, and areas requiring attention.

**Example:** Tracking defect rates in manufacturing processes to ensure that quality standards are met.

### 4. Benchmarking:

Comparing organizational processes, products, or services with industry best practices to identify areas for improvement.

**Example:** A company may benchmark its customer service response time against industry leaders.





## Real-World Examples

**Toyota** : Toyota's production system, often called Lean, emphasizes waste reduction, quality at every step, and continuous improvement. Their commitment to quality and efficiency has made them a global leader in automotive manufacturing.

**Motorola** : Motorola introduced Six Sigma in the 1980s, a methodology for improving process quality and reducing defects. The company saw significant improvements in product reliability and customer satisfaction.



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## Introduction to Quality

### What is Quality?

- Quality refers to meeting or exceeding customer expectations and adhering to established standards.
- It involves **reliability**, **consistency**, and **superior performance** in products and services.

### Importance of Quality:

- Quality is central to the success and sustainability of any organization.
- It drives customer satisfaction, improves efficiency, and builds competitive advantage.



## Customer Satisfaction and Loyalty

### Meeting Customer Expectations:

Customers today expect high-quality products that meet their needs and preferences.

Consistently high-quality products enhance **customer satisfaction**, which leads to repeat business and brand loyalty.

### Building Trust:

When companies deliver quality, customers trust the brand, ensuring long-term relationships.

**Example: Apple** has earned customer loyalty by consistently offering high-quality, innovative products.



## Competitive Advantage and Cost Efficiency

### Differentiating Through Quality:

Quality can be a powerful differentiator in crowded markets, helping businesses stand out from competitors.

### Operational Efficiency:

A focus on quality leads to fewer defects, lower returns, and reduced rework, which translates into cost savings and operational efficiency.

**Example: Toyota's** focus on quality through Lean manufacturing helps them reduce waste, improve efficiency, and maintain a competitive edge.



## Regulatory Compliance and Risk Mitigation

### Meeting Legal and Industry Standards:

High-quality standards ensure compliance with industry regulations, which is crucial for maintaining legal operations.

### Risk Management:

Quality reduces the risks associated with product failures, recalls, and legal penalties, helping companies avoid costly fines and damage to their reputation.

**Example:** In the **pharmaceutical industry**, ensuring high-quality production is essential for compliance with strict regulatory bodies like the **FDA**.



## Employee Engagement and Satisfaction

### Employee Involvement in Quality:

A focus on quality encourages employees to take ownership and pride in their work, leading to better job satisfaction and engagement.

### Positive Work Culture:

Companies that prioritize quality foster a work environment where employees feel valued, which boosts morale and reduces turnover.

**Example: 3M** encourages its employees to contribute ideas for improving product quality, leading to higher innovation and employee satisfaction.



## Conclusion

### Summary:

Quality is crucial for **customer satisfaction**, **cost management**, and **brand reputation**.

Organizations that prioritize quality can achieve **operational efficiency**, **competitive advantage**, and **long-term success**.

### Final Thought:

**"Quality is the foundation of success in any business."**





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Topic : Evolution of quality



## Early Concepts of Quality

### **Pre-Industrial Era:**

In ancient times, the focus on quality was rudimentary and based mostly on craftsmanship and individual artisans.

**Quality Control:** Early quality was ensured through the skill of individual craftsmen, who personally oversaw the entire production process.

**Examples:** Pottery, metalwork, and handmade goods where artisans focused on maintaining a high standard of craftsmanship.

**Quality in Agriculture:** Farmers focused on maintaining high-quality products, such as grains and livestock, through traditional methods passed down through generations.



## The Industrial Revolution (Late 18th - 19th Century)

### Mass Production and Standardization:

- The Industrial Revolution introduced **mass production** and the need for standardized processes to meet increased demand.
- The rise of factories and machinery shifted the focus of quality from individual craftsmanship to maintaining consistency across large-scale production lines.

### Quality Control Emerges:

**Inspection-Based Quality Control:** Quality was ensured through inspection, where products were checked after manufacturing to identify defects and remove substandard items.

However, this system did not focus on preventing defects but on detecting and eliminating them post-production.



## Early 20th Century: Scientific Management and Statistical Methods

### Frederick Taylor and Scientific Management:

**Frederick Taylor**, known as the father of **Scientific Management**, emphasized efficiency in manufacturing and the systematic optimization of labor.

He contributed to the idea that quality could be improved by optimizing work processes, leading to **increased productivity** and **efficiency**.

### Statistical Quality Control (SQC):

**Walter Shewhart**, in the 1920s, developed the concept of using **statistical methods** for quality control, particularly the **control chart**.

**Statistical Process Control (SPC)**: This focused on using data to monitor and control production processes, allowing for early identification of problems.



## Mid-20th Century: Quality Becomes a Strategic Focus

### **Post-WWII and the Birth of Total Quality Management (TQM):**

After World War II, Japan, under the guidance of quality experts like **W. Edwards Deming** and **Joseph Juran**, revolutionized quality management by adopting **statistical methods** and **continuous improvement** processes.

**Total Quality Management (TQM):** Focused on improving quality across all areas of the business, from production to customer service, involving all employees in the pursuit of excellence.



## Late 20th Century: Quality in the Global Context

### ISO 9000 Standards:

In the late 1980s, the **ISO 9000** series of standards were developed to help businesses ensure consistent quality in products and services, and gain international recognition.

These standards focused on process improvement, customer satisfaction, and compliance with international norms, which became essential for businesses aiming to compete globally.

### Six Sigma:

**Six Sigma**, introduced by **Motorola** in the 1980s, became a prominent methodology for improving quality by reducing defects and variability.

Six Sigma focuses on achieving **near-perfect processes** by using data and statistical tools to eliminate defects and improve process efficiency.





## 21st Century: The Modern Era of Quality

### **Customer-Centric Quality:**

In the 21st century, quality is not just about meeting technical standards but also about meeting **customer expectations**. Businesses now focus on delivering value, convenience, and exceptional customer experiences.

**Lean Management** and **Agile Methodologies**: These approaches focus on improving quality by continuously adapting to customer needs and improving processes through collaboration, flexibility, and efficiency.

### **Technology-Driven Quality:**

The integration of **Artificial Intelligence (AI)**, **Big Data**, and **Internet of Things (IoT)** has allowed for smarter quality management systems.

Real-time monitoring and predictive analytics enable businesses to anticipate quality issues before they occur and make data-driven decisions to prevent defects.