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DEPARTMENT OF AEROSPACE ENGINEERING

19MEE304 Total Quality Management

Topic: Basic Concepts of TQM – TQM Framework

Introduction to Total Quality Management (TQM)

- **Definition:** TQM is a **holistic approach** that focuses on **continuous quality improvement** across all processes, involving **all employees and stakeholders**.
- **Objective:** Achieve **long-term customer satisfaction, defect reduction, and operational efficiency**.

Key Principles of TQM

1. **Customer Focus** – Meeting or exceeding customer expectations.
2. **Continuous Improvement (Kaizen)** – Never-ending quality enhancement.
3. **Employee Involvement** – Quality is everyone's responsibility.
4. **Process Approach** – Managing processes efficiently.
5. **Fact-Based Decision Making** – Using data for quality control.
6. **Integrated System** – Quality is embedded across departments.
7. **Mutual Supplier Relationships** – Long-term supplier partnerships.

TQM Framework: Components & Structure

TQM is built on several structured elements:

A. Leadership & Strategic Commitment

- Top management **drives quality culture**.
- Leaders set **vision, policies, and quality goals**.
- Example: **Toyota's leadership promotes continuous improvement (Kaizen)**.

B. Customer-Centric Approach

- Quality should be defined by the **customer's perspective**.
- Uses **Quality Function Deployment (QFD)** to translate customer needs into product features.
- Example: **Apple's product designs focus on user experience (UX)**.

C. Continuous Improvement (Kaizen)

- Small, incremental improvements over time.

- Uses **Plan-Do-Check-Act (PDCA) Cycle**:
 1. **Plan** – Identify problems, set objectives.
 2. **Do** – Implement solutions.
 3. **Check** – Monitor results.
 4. **Act** – Standardize successful improvements.

D. Employee Involvement & Teamwork

- **Quality Circles**: Small groups solving quality-related issues.
- **Training Programs**: Employees learn problem-solving tools.
- **Empowerment**: Workers can suggest improvements.

E. Process Management & Standardization

- Use of **Six Sigma** and **Lean Manufacturing** to optimize processes.
- **Statistical Process Control (SPC)** ensures consistency.
- **Standard Operating Procedures (SOPs)** guide quality practices.

F. Supplier Quality Management

- Supplier selection based on **quality, reliability, and consistency**.
- **Supplier audits** and **long-term partnerships** ensure **high-quality raw materials**.

G. Performance Measurement & Benchmarking

- **Key Performance Indicators (KPIs)** track quality metrics.
- **Benchmarking** compares performance with industry leaders.
- Example: **Motorola's Six Sigma reduced defects drastically.**

TQM Models & Methodologies

A. Deming's 14 Points for TQM

- **W. Edwards Deming** proposed a set of quality principles, such as:
 - Improve constantly.
 - Focus on **prevention, not inspection**.
 - Remove barriers between departments.

B. Juran's Quality Trilogy

- **Quality Planning** – Setting goals and strategies.
- **Quality Control** – Monitoring and adjusting processes.
- **Quality Improvement** – Implementing corrective actions.

C. Crosby's Zero Defects Philosophy

- Quality means **conformance to requirements**.
- **Defect prevention** instead of defect detection.

Case Study: TQM Implementation at Toyota

- **Toyota Production System (TPS)** integrates **Kaizen, Lean, and JIT (Just-in-Time)**.
- **Quality Circles** solve daily production issues.
- **Six Sigma** minimizes defects in assembly lines.
- **Outcome:** Toyota became a **global leader in quality management**.

Benefits of TQM Implementation

- ✓ **Customer Satisfaction** – Fewer defects, better experiences.
- ✓ **Cost Reduction** – Minimizing rework and wastage.
- ✓ **Employee Motivation** – Increased engagement in quality culture.
- ✓ **Market Competitiveness** – High-quality reputation drives sales.

Conclusion

TQM is a **structured, company-wide approach** that ensures **continuous quality improvement** by involving **leaders, employees, suppliers, and customers**. Companies adopting TQM **enhance operational efficiency, reduce costs, and build long-term customer trust**.