

Introduction to Quality Management

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Key concepts, principles, and tools for delivering products and services that meet or exceed customer expectations.

1. What Is Quality Management?

Aspect	Definition
Quality	Degree to which a set of inherent characteristics fulfills requirements.
Quality Management (QM)	Coordinated activities to direct and control an organization in establishing, implementing, and improving quality.
Goal	Consistently deliver value to customers while optimizing cost, time, and resources.

2. Core Components of Quality Management

1. Quality Planning

- Identify customer needs and regulatory requirements.
- Define quality objectives, metrics, and processes.
- Develop a quality management plan (QMP).

2. Quality Assurance (QA)

- Systematic activities to provide confidence that quality requirements will be met.
- Focus on **processes** (e.g., audits, standard operating procedures).
- Prevents defects rather than detecting them.

3. Quality Control (QC)

- Operational techniques and activities used to fulfill quality requirements.
- Focus on **products** (e.g., inspections, testing).
- Detects and corrects defects.

4. Continuous Improvement

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- Ongoing effort to enhance processes, products, and services.
- Uses data-driven methods (e.g., PDCA, Kaizen, Six Sigma).

3. Fundamental Quality Principles (ISO 9001:2015)

#	Principle	Practical Meaning
1	Customer focus	Understand and meet customer needs; measure satisfaction.
2	Leadership	Establish vision, create an environment for people to contribute.
3	Engagement of people	Involve all employees; empower decision-making.
4	Process approach	Manage activities as interrelated processes for efficiency.
5	Improvement	Pursue incremental and breakthrough improvements.
6	Evidence-based decision making	Base actions on reliable data and analysis.
7	Relationship management	Build mutually beneficial relationships with suppliers and partners.

4. Major Quality Management Frameworks

Framework	Scope	Key Features
ISO 9001	General-purpose QMS	Requirements for a documented system; certification possible.
Total Quality Management (TQM)	Organization-wide culture	Customer focus, continuous improvement, employee involvement.
Six Sigma	Process improvement	DMAIC (Define-Measure-Analyze-Improve-Control); statistical reduction of variation.
Lean	Waste elimination	Value-stream mapping, 5S, pull systems, just-in-time production.
Baldrige Excellence Framework	U.S. performance excellence	Criteria for leadership, strategy, customers, workforce, operations, results.

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5. The PDCA Cycle (Deming Cycle)

1. **Plan** – Identify a problem or opportunity; set objectives; design a process or change.
2. **Do** – Implement the plan on a small scale or pilot.
3. **Check** – Measure results; compare with expectations; analyze gaps.
4. **Act** – Standardize successful changes or adjust and repeat.

PDCA is the backbone of continuous improvement across most QM systems.

6. Common Quality Tools

Category	Tools	Typical Use
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Statistical Control		
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