

CHAPTER 1

INTRODUCTION TO QUALITY

Expected Outcomes

Define quality, quality control, quality improvement, statistical quality control, quality assurance, and process.

Be able to describe FMEA, QFD, ISO 9000, ISO 14000, Benchmarking, TPM, Quality by Design,

Learning Objectives

When you have completed this chapter you should be able to:

- Define quality, quality control, quality improvement, statistical quality control, quality assurance, and process.
- Be able to describe FMEA, QFD, ISO 9000, ISO 14000, Benchmarking, TPM, Quality by Design,

Definitions

Quality

- Quality is a perceptual, conditional, and somewhat subjective attribute and may be understood differently by different people. Consumers may focus on the specification quality of a product/service, or how it compares to competitors in the marketplace

Definitions (Continued)

Quality Control--Use of techniques to achieve and sustain the quality.

Quality Improvement--Use of tools and techniques to continually improve the product, service, or process.

Statistical Quality Control—Use of statistics to control the quality.

Definitions (Continued)

Quality Assurance--Planned or systematic actions necessary to provide adequate confidence that the product or service will satisfy given requirements.

Process--Set of interrelated activities that uses specific inputs to produce specific outputs. Includes both internal and external customers and suppliers.

Failure Mode & Effect Analysis (FMEA)

- ❑ Identifies foreseeable failure modes and plans for elimination.
- ❑ Group of activities to:
 - Recognize and evaluate potential failures,
 - Identify actions that could eliminate or reduce them,
 - Document the process.
- ❑ Two types – design and process.

Quality Function Deployment (QFD)

- ❑ Identifies and sets priorities for process improvement.
- ❑ Multifunction team uses 'voice of the customer' to achieve results throughout the organization.
- ❑ It reduces start-up costs and design changes that lead to increased customer satisfaction.

ISO 9000 (QMS)

- ❑ ISO Stands for International Organization for Standards.
- ❑ QMS stands for Quality Management System.
- ❑ The standard, recognized by over 100 countries, is divided into three parts.
 - Fundamentals and vocabulary,
 - Requirements, and
 - Improvement guidance.

ISO 9000 (Continued)

- ❑ Five clauses of the requirement's part are:
 - Continual improvement
 - Management Responsibility
 - Resource Management
 - Product Realization
 - Measurement, Analysis, and Improvement
- ❑ Related to customer requirements and satisfaction.

ISO 14000 (EMS)

- ❑ International standard for an environmental management system (EMS).
- ❑ Describes the requirements for registration and/or self-declaration.
- ❑ Requirements based on the process--not on the products or services.
- ❑ Continual improvement for environmental protection.

ISO 14000 (Continued)

- The four sections are:
 - Environment policy,
 - Planning, implementation, & operations,
 - Checking and corrective action,
 - Management review.

Benchmarking

- ❑ Benchmarking was developed by Xerox in 1979. The idea is to find another company that is doing a particular process better than your company, and then, using that information to improve the process.
- ❑ Constant testing of industry's best practices.

Total Productive Maintenance

- ❑ Total Productive Maintenance (TPM) is a technique that utilizes the entire work force to obtain the optimum use of equipment.
- ❑ The technical skills in TPM are: daily equipment checking, machine inspection, fine-tuning machinery, lubrication, troubleshooting, and repair.

Quality by Design

- ❑ Quality by Design is the practice of using a multidisciplinary team to conduct product or service conception, design, and production planning at one time.
- ❑ The major benefits are faster product development, shorter time to market, better quality, less work-in-process, fewer engineering change orders, and increased productivity

Products Liability

- ❑ Consumers are initiating lawsuits in record numbers as a result of injury, death, and property damage from faulty product or service design or faulty workmanship.
- ❑ Reasons for injuries:
 - ❑ Behavior or knowledge of the user.
 - ❑ Environment where the product is used.
 - ❑ Design and production of the item.

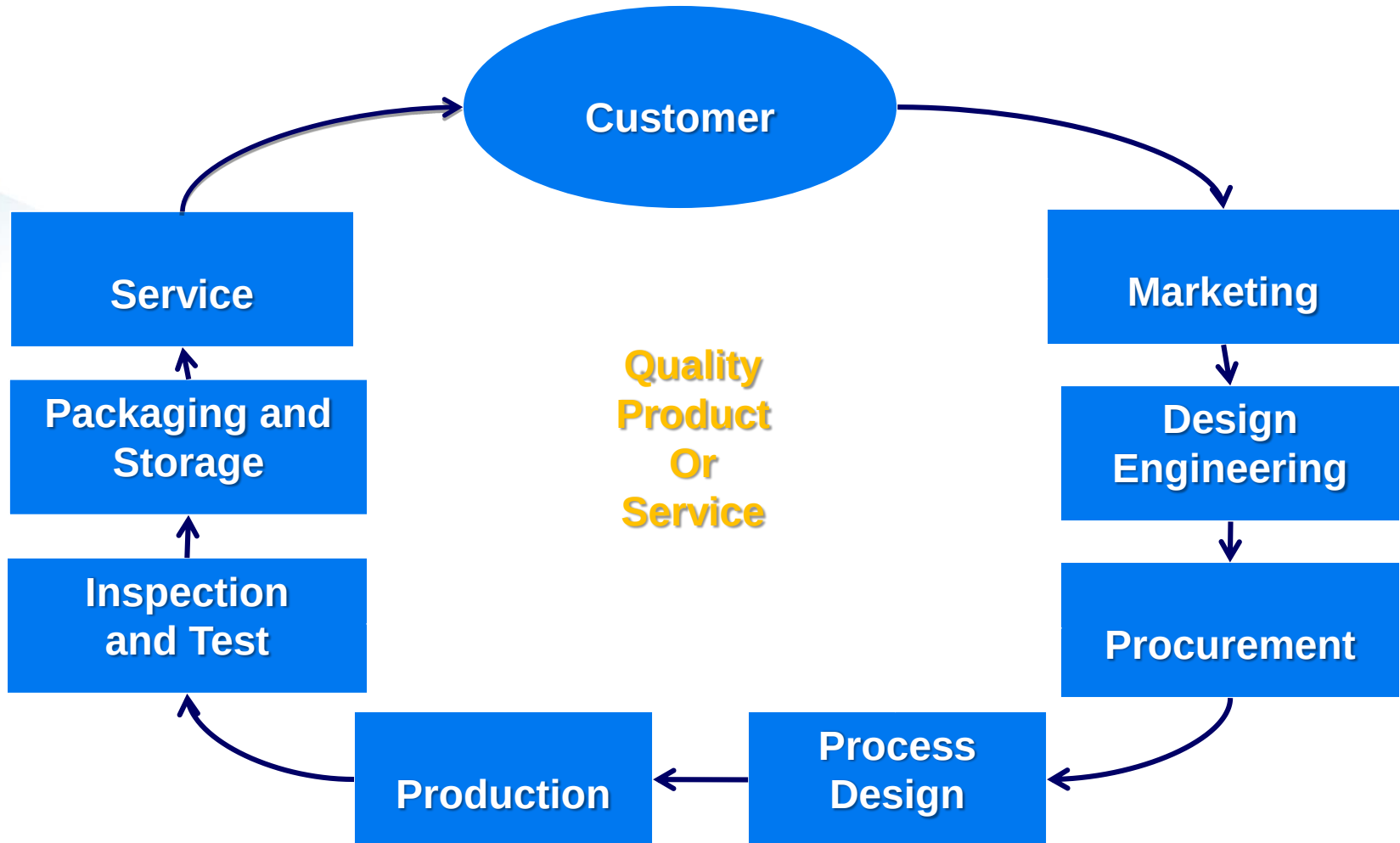
Historical Review

- ❑ Skilled craftsmanship during Middle Ages
- ❑ Industrial Revolution: rise of inspection and separate quality departments
- ❑ Statistical methods at Bell System (1924)
- ❑ The American Society for Quality (1946)
- ❑ Deming (1950)
- ❑ Juran (1954)

Historical Review (Continued)

- ❑ First Quality Control Circles (1960)
- ❑ 1980s
 - ❑ TQM
 - ❑ Statistical Process Control, SPC
 - ❑ Malcolm Baldrige National Quality Award
 - ❑ Taguchi
- ❑ ISO (1990)
- ❑ Via Internet (2000)

Responsibility for Quality



Responsibility for Quality

Marketing

- ❑ Help to evaluate the level of product quality that a customer wants, needs..

Design Engineering

- ❑ Translate the customer's requirements into operating characteristics, exact specifications, and appropriate tolerances

Procurement

- ❑ Responsible for procuring quality materials and components

Responsibility for Quality (Continued)

Process Design

- ❑ Develops processes and procedures that will produce a quality product/service

Production

- ❑ Produce quality products and services

Inspection and Test

- ❑ Appraise the quality of purchased and manufactured items and to report the results

REFERENCES

1) BESTERFIELD, QUALITY IMPROVEMENT, 9TH EDITION, PEARSON

2) THOMAS PYZDEK, QUALITY ENGINEERING HANDBOOK