

Managing Quality

Outline

Quality Definitions Service Quality Quality Planning, Control, and Improvement Quality Pioneers ■ ISO 9000 Standards Malcolm Baldrige Award Supply Chain Quality Quality and Financial Performance Why Some Quality Improvement Efforts Fail

Introduction

Quality is one of the four key objectives of operations (cost, flexibility, delivery, quality) Historical development of quality concepts – Inspection (early 1900s) - Statistics quality control (Shewhart - 1940s) – Quality management (1960s) Quality is responsibility of everyone in the organization

Quality

Meeting, or exceeding, customer requirements now and in the future.

i.e., the product or service is fit for the customer's use

Dimensions of Quality



Quality of Design

Determined before the product is produced
 Translates the "wishes" of customers into specifications

Concurrent design through the QFD process

Quality of Conformance

Producing a product to meet the specifications (independent of quality of design)

Abilities

- Availability (Continuity of service to customers)
- Reliability (Length of time that a product can be used before it fails—MTBF)
- Maintainability (Restoration of the product or service once it has failed—MTTR)



Field Service

Warranty and repair or replacement of the product after it has been sold Also called customer service, sales service, or just service Dimensions – Promptness - Competence – Integrity

Different Types of Quality (Figure 8.1)

		Quality of market research
ustomer tisfaction	Quality of design	Quality of concept
		Quality of specification
		Technology
	Quality of conformance	Employees
		Management
		Reliability
	Availability	Maintainability
		Logistical support
		Promptness
	Field service	Competence
		Integrity

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Service Quality

Service measures are perceptual or subjective
 SERVQUAL is most popular measure

- Tangibles
- Reliability
- Responsiveness
- Assurance
- Empathy

Figure 8.2: The Quality Cycle



Quality Cycle in Mass Transit System Figure 8.3



Implementation of quality improvement through the quality cycle

Define quality attributes on the basis of customer needs
Decide how to measure each attribute
Set quality standards
Establish appropriate tests for each standard
Find and correct causes of poor quality
Continue to make improvements

Poka-Yoke

Developed by Toyota's Shigeo Shingo in the 1960s

Means 'mistake proofing'

Design the product and process so that mistakes cannot occur or are immediately detectable

Poka-Yoke



Poka-Yoke: German beer is packaged in green bottles for domestic use, brown bottles for export.

Quality is not a new idea



The label on the bottles reads:

"Brewed according to the German Purity Regulations of 1516"

The Quality Pioneers

■ W. Edwards Deming (1900-1993)

Joseph Juran (1904-2008)

plus many others

W. Edwards Deming

The 14 Management Principles
Advocate of statistical process control
Emphasis on continuous improvement
PDCA Wheel *http://www.deming.org/*





CI Methodology: PDCA Cycle (Shewart/Deming Wheel)



Root Causes of Quality Problems

Text: "...most quality problems are caused by poor systems, not by the workers"

- Deming: 90 percent of quality problems are caused by management
- J.D. Power: at least 2/3 of long-term quality problems in autos are engineering and design problems

Joseph Juran

Quality "Trilogy"—planning, control and improvement
Emphasis on management
"Quality Handbook"
Lived to age 104
<u>http://www.juran.com/main.html</u>





When 99.9% Quality is Not Enough

- Two million documents would be lost by IRS each year
- 22,000 checks would be deducted from the wrong bank account in the U.S.
- 1314 phone calls in the U.S. misrouted each day
- 12 babies would be given to the wrong parents each day
- Two plane landings daily at O'Hare Airport in Chicago would be unsafe
- The space shuttle would explode every time it is launched

How Much Quality is Enough?

1999: 98,000 hospital deaths from medical errors in the U.S.; 7000 from medication errors

Only 80% of hospitals in the U.S. have procedures in place to avoid operating on the wrong body parts

IRS agents give bad or no information 43% of the time (in 2002 study by Dept. of Treasury)

ISO 9000

- Guidelines for designing, manufacturing, selling, and servicing products. Est. 1987.
- Selecting an ISO 9000 certified supplier provides some assurance that supplier follows accepted business practices in areas covered by the standard.
- Required by many companies, especially in Europe, before one can be a supplier.
- www.iso.ch

ISO 9000 Standards Quality Management Principles

Principle 1 Customer focus Principle 2 Leadership Principle 3 Involvement of people Principle 4 Process approach Principle 5 System approach to management Principle 6 Continual improvement Principle 7 Factual approach to decision making Principle 8 Mutually beneficial supplier relationships



Airports can be ISO 9000 certified

Hotels can be ISO 9000 certified



ISO 14000

- Series of standards covering environmental management systems, environmental auditing, evaluation of environmental performance, environmental labeling, and life-cycle assessment.
- Intent is to help organizations improve their environmental performance through documentation control, operational control, control of records, training, statistical techniques, and corrective and preventive actions.

Malcolm Baldrige Award



- Established in 1987 to promote better quality management practices and improved quality results by American industry
- Named for Malcolm Baldrige, former Secretary of Commerce
- Given to at most three companies in each of six categories (see slide 32)

Criteria and point system (see Table 8.3 and <u>www.baldrige.gov</u>)

Baldrige Criteria

- 1. Leadership
- 2. Strategic Planning
- 3. Customer Focus
- 4. Measurement, Analysis, and Knowledge Management
- 5. Workforce Focus
- 6. Process Management
- 7. Results

Categories for Baldrige Award Applicants

Manufacturing companies or subsidiaries that

- produce and sell manufactured products or manufacturing processes or
- produce agricultural, mining, or construction products.
- Service companies or subsidiaries that sell service
- Small businesses
- Health care organizations
- Educational institutions
- Government/non-profit organizations

Malcolm Baldrige National Quality Award



Supply Chain Quality

Principles for outsourcing:

- Supplier involved in product design
- Suppliers maintain high quality (rolled yield)
- Operations must manage risk (e.g. defective toys)
- Suppliers should be certified (e.g. ISO 9000)
- Don't rely just on price and product samples

Quality and Financial Performance

Quality costs

- Prevention Costs
- Appraisal Costs
- Internal Failure Costs
- External Failure Costs
- Incurring prevention costs can lead to avoiding or reducing the other three.

How Quality Contributes to Profitability (Fig. 8.5)



Reasons for Failure in Quality Improvement Programs

Focus on short-term financial results
"Blame the employee" syndrome
Belief in "tradeoffs" in quality (don't believe "quality is free")
Management interference with true teamwork More Reasons for Failure in Quality Improvement Programs

Lack of top management support
Resistance to change
Internal politics and rivalries
Belief the quality is just the latest buzz word
Insufficient training
Management mobility

Summary

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