Quality and Strategy

Strategi manajer operasi sasarannya adalah membangun sistem TQM yang mengidentifikasi dan memuaskan pelanggan.

Quality and Strategy

- Managing quality supports differentiation, low cost, and response strategies
- Quality helps firms increase sales and reduce costs
- Building a quality organization is a demanding task
Two Ways Quality Improves Profitability

**Sales Gains via**
- Improved response
- Flexible pricing
- Improved reputation

**Reduced Costs via**
- Increased productivity
- Lower rework and scrap costs
- Lower warranty costs

**Improved Quality**

**Increased Profits**

The Flow of Activities

**Organizational Practices**
- Leadership, Mission statement, Effective operating procedures, Staff support, Training
- Yields: What is important and what is to be accomplished

**Quality Principles**
- Customer focus, Continuous improvement, Benchmarking, Just-in-time, Tools of TQM
- Yields: How to do what is important and to be accomplished

**Employee Fulfillment**
- Empowerment, Organizational commitment
- Yields: Employee attitudes that can accomplish what is important

**Customer Satisfaction**
- Winning orders, Repeat customers
- Yields: An effective organization with a competitive advantage

Defining Quality

The totality of features and characteristics of a product or service that bears on its ability to satisfy stated or implied needs

American Society for Quality
Different Views

- **User-based**: better performance, more features
- **Manufacturing-based**: conformance to standards, making it right the first time
- **Product-based**: specific and measurable attributes of the product

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Implications of Quality

1. **Company reputation**
   - Perception of new products
   - Employment practices
   - Supplier relations
2. **Product liability**
   - Reduce risk
3. **Global implications**
   - Improved ability to compete

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Key Dimensions of Quality

- Performance
- Features
- Reliability
- Conformance
- Durability
- Serviceability
- Aesthetics
- Perceived quality
- Value
Costs of Quality

- **Prevention costs** - reducing the potential for defects
- **Appraisal costs** - evaluating products, parts, and services
- **Internal failure** - producing defective parts or service before delivery
- **External costs** - defects discovered after delivery

Costs of Quality

- **Total Cost**
  - **External Failure**
  - **Internal Failure**
  - **Prevention**
  - **Appraisal**

Quality Improvement

Ethics and Quality Management

- Operations managers must deliver healthy, safe, quality products and services
- Poor quality risks injuries, lawsuits, recalls, and regulation
- Organizations are judged by how they respond to problems
- All stakeholders must be considered
**International Quality Standards**

- ISO 9000 series (Europe/EC)
  - Common quality standards for products sold in Europe (even if made in U.S.)
  - 2008 update places greater emphasis on leadership and customer requirements and satisfaction
- ISO 14000 series (Europe/EC)

**ISO 14000 Environmental Standard**

**Core Elements:**

- Environmental management
- Auditing
- Performance evaluation
- Labeling
- Life cycle assessment

**Advantages:**

- Positive public image and reduced exposure to liability
- Systematic approach to pollution prevention
- Compliance with regulatory requirements and opportunities for competitive advantage
- Reduction in multiple audits
**TQM**

Encompasses entire organization, from supplier to customer
Stresses a commitment by management to have a continuing, companywide drive toward excellence in all aspects of products and services that are important to the customer

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**Seven Concepts of TQM**

1. Continuous improvement
2. Six Sigma
3. Employee empowerment
4. Benchmarking
5. Just-in-time (JIT)
6. Taguchi concepts
7. Knowledge of TQM tools

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**Continuous Improvement**

◆ Represents continual improvement of all processes
◆ Involves all operations and work centers including suppliers and customers
  ◆ People, Equipment, Materials, Procedures
**Six Sigma**

- Two meanings
  - Statistical definition of a process that is 99.9997% capable, 3.4 defects per million opportunities (DPMO)
  - A program designed to reduce defects, lower costs, and improve customer satisfaction

**Employee Empowerment**

- Getting employees involved in product and process improvements
  - 85% of quality problems are due to process and material
- Techniques
  - Build communication networks that include employees
  - Develop open, supportive supervisors
  - Move responsibility to employees
  - Build a high-morale organization
  - Create formal team structures
Benchmarking

Selecting best practices to use as a standard for performance

1. Determine what to benchmark
2. Form a benchmark team
3. Identify benchmarking partners
4. Collect and analyze benchmarking information
5. Take action to match or exceed the benchmark

Just-in-Time (JIT)

Relationship to quality:

- JIT cuts the cost of quality
- JIT improves quality
- Better quality means less inventory and better, easier-to-employ JIT system

Just-in-Time (JIT)

- ‘Pull’ system of production scheduling including supply management
- Production only when signaled
- Allows reduced inventory levels
- Inventory costs money and hides process and material problems
- Encourages improved process and product quality
**Just-In-Time (JIT) Example**

Work in process inventory level (hides problems)

Unreliable Vendors

Scrap

Capacity Imbalances

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**Just-In-Time (JIT) Example**

Reducing inventory reveals problems so they can be solved

Unreliable Vendors

Scrap

Capacity Imbalances

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**Taguchi Concepts**

- Engineering and experimental design methods to improve product and process design
  - Identify key component and process variables affecting product variation
- Taguchi Concepts
  - Quality robustness
  - Quality loss function
  - Target-oriented quality
Quality Robustness

- Ability to produce products uniformly in adverse manufacturing and environmental conditions
- Remove the effects of adverse conditions
- Small variations in materials and process do not destroy product quality

Quality Loss Function

- Shows that costs increase as the product moves away from what the customer wants
- Costs include customer dissatisfaction, warranty and service, internal scrap and repair, and costs to society
- Traditional conformance specifications are too simplistic

Quality Loss Function

Unacceptable Poor Fair Good Best

Target-oriented quality yields more product in the "best" category
Target-oriented quality brings product toward the target value
Conformance-oriented quality keeps products within 3 standard deviations

$L = D^2C$
where $L$ = loss to society, $D$ = distance from target value, $C$ = cost of deviation

Figure 6.5
Tools of TQM

- Tools for Generating Ideas
  - Check sheets
  - Scatter diagrams
  - Cause-and-effect diagrams
- Tools to Organize the Data
  - Pareto charts
  - Flowcharts

Tools of TQM

- Tools for Identifying Problems
  - Histogram
  - Statistical process control chart

Seven Tools of TQM

(a) Check Sheet: An organized method of recording data

<table>
<thead>
<tr>
<th>Defect</th>
<th>Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

Figure 6.6
Seven Tools of TQM

(b) Scatter Diagram: A graph of the value of one variable vs. another variable

![Scatter Diagram](image)

Seven Tools of TQM

(c) Cause-and-Effect Diagram: A tool that identifies process elements (causes) that might effect an outcome

![Cause-and-Effect Diagram](image)

Seven Tools of TQM

(d) Pareto Chart: A graph to identify and plot problems or defects in descending order of frequency

![Pareto Chart](image)
Seven Tools of TQM

(e) Flowchart (Process Diagram): A chart that describes the steps in a process

(f) Histogram: A distribution showing the frequency of occurrences of a variable

(g) Statistical Process Control Chart: A chart with time on the horizontal axis to plot values of a statistic
**Cause-and-Effect Diagrams**

- Material (ball)
- Size of ball
- Grip/Feel (ball)
- Air pressure
- Lopsidedness
- Method (shooting process)
- Aiming point
- Follow-through
- Balance
- Rim size
- Rim height
- Backboard stability
- Manpower (shooter)
- Machine (hoop & backboard)

**Pareto Charts**

**MRI Flowchart**

1. Physician schedules MRI
2. Patient taken to MRI
3. Patient signs in
4. Patient is prepped
5. Technician carries out MRI
6. Technician inspects film
7. If unsatisfactory, repeat
8. Patient taken back to room
9. MRI read by radiologist
10. MRI report transferred to physician
11. Patient and physician discuss
Statistical Process Control (SPC)

- Uses statistics and control charts to tell when to take corrective action
- Drives process improvement
- Four key steps
  - Measure the process
  - When a change is indicated, find the assignable cause
  - Eliminate or incorporate the cause
  - Restart the revised process

An SPC Chart

- Plots the percent of free throws missed

<table>
<thead>
<tr>
<th>Game number</th>
<th>Plots the percent of free throws missed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>20%</td>
</tr>
<tr>
<td>2</td>
<td>10%</td>
</tr>
<tr>
<td>3</td>
<td>0%</td>
</tr>
<tr>
<td>4</td>
<td>10%</td>
</tr>
<tr>
<td>5</td>
<td>20%</td>
</tr>
<tr>
<td>6</td>
<td>10%</td>
</tr>
<tr>
<td>7</td>
<td>0%</td>
</tr>
<tr>
<td>8</td>
<td>10%</td>
</tr>
<tr>
<td>9</td>
<td>20%</td>
</tr>
</tbody>
</table>

Figure 6.8

Inspection

- Involves examining items to see if an item is good or defective
- Detect a defective product
  - Does not correct deficiencies in process or product
  - It is expensive
- Issues
  - When to inspect
  - Where in process to inspect
When and Where to Inspect
1. At the supplier’s plant while the supplier is producing
2. At your facility upon receipt of goods from the supplier
3. Before costly or irreversible processes
4. During the step-by-step production process
5. When production or service is complete
6. Before delivery to your customer
7. At the point of customer contact

Inspection
◆ Many problems
  ◆ Worker fatigue
  ◆ Measurement error
  ◆ Process variability
◆ Cannot inspect quality into a product
◆ Robust design, empowered employees, and sound processes are better solutions

Source Inspection
◆ Also known as source control
◆ The next step in the process is your customer
◆ Ensure perfect product to your customer

Poka-yoke is the concept of foolproof devices or techniques designed to pass only acceptable product
### Service Industry Inspection

<table>
<thead>
<tr>
<th>Organization</th>
<th>What is Inspected</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jones Law Office</td>
<td>Receptionist</td>
<td>Is phone answered by the second ring</td>
</tr>
<tr>
<td></td>
<td>performance</td>
<td>Accurate, timely, and correct format</td>
</tr>
<tr>
<td></td>
<td>Billing</td>
<td>Promptness in returning calls</td>
</tr>
<tr>
<td></td>
<td>Attorney</td>
<td></td>
</tr>
</tbody>
</table>

**Table 6.4**

---

<table>
<thead>
<tr>
<th>Organization</th>
<th>What is Inspected</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard Rock Hotel</td>
<td>Reception desk</td>
<td>Use customer’s name</td>
</tr>
<tr>
<td></td>
<td>Doorman</td>
<td>Greet guest in less than 30 seconds</td>
</tr>
<tr>
<td></td>
<td>Room</td>
<td>All lights working, spotless bathroom</td>
</tr>
<tr>
<td></td>
<td>Minibar</td>
<td>Restocked and charges accurately posted to bill</td>
</tr>
</tbody>
</table>

**Table 6.4**

---

<table>
<thead>
<tr>
<th>Organization</th>
<th>What is Inspected</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arnold Palmer Hospital</td>
<td>Billing</td>
<td>Accurate, timely, and correct format</td>
</tr>
<tr>
<td></td>
<td>Pharmacy</td>
<td>Prescription accuracy, inventory accuracy</td>
</tr>
<tr>
<td></td>
<td>Lab</td>
<td>Audit for lab-test accuracy</td>
</tr>
<tr>
<td></td>
<td>Nurses</td>
<td>Charts immediately updated</td>
</tr>
<tr>
<td></td>
<td>Admissions</td>
<td>Data entered correctly and completely</td>
</tr>
</tbody>
</table>

**Table 6.4**
**Service Industry Inspection**

<table>
<thead>
<tr>
<th>Organization</th>
<th>What is Inspected</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olive Garden Restaurant</td>
<td>Busboy</td>
<td>Serves water and bread within 1 minute</td>
</tr>
<tr>
<td></td>
<td>Busboy</td>
<td>Clears all entrée items and crumbs prior to dessert</td>
</tr>
<tr>
<td></td>
<td>Waiter</td>
<td>Knows and suggest specials, desserts</td>
</tr>
</tbody>
</table>

Table 6.4

<table>
<thead>
<tr>
<th>Organization</th>
<th>What is Inspected</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nordstrom Department Store</td>
<td>Display areas</td>
<td>Attractive, well-organized, stocked, good lighting</td>
</tr>
<tr>
<td></td>
<td>Stockrooms</td>
<td>Rotation of goods, organized, clean</td>
</tr>
<tr>
<td></td>
<td>Salesclerks</td>
<td>Neat, courteous, very knowledgeable</td>
</tr>
</tbody>
</table>

Table 6.4

**Attributes Versus Variables**

- **Attributes**
  - Items are either good or bad, acceptable or unacceptable
  - Does not address degree of failure
- **Variables**
  - Measures dimensions such as weight, speed, height, or strength
  - Falls within an acceptable range
  - Use different statistical techniques
TQM In Services

- Service quality is more difficult to measure than the quality of goods
- Service quality perceptions depend on
  - Intangible differences between products
  - Intangible expectations customers have of those products

Service Quality

The Operations Manager must recognize:

1. The tangible component of services is important
2. The service process is important
3. The service is judged against the customer’s expectations
4. Exceptions will occur

Service Specifications at UPS

- "All Good Kids Love Black": Be the model of all actions, learn that in your own manner, become yourself and make sure that act.
- No smoking in front of customers.
- Underwear must be white at all times.
- Use the right size, wool Alumni appear to be holding hands.
- Keep the hand on the side of the bag.
- Teach presence, be waiting at thresholds or entrances.
- Present yourself for two years.
- Last dress nicely and appear to be a stud of leisure.
- Walk briskly, no slouching allowed.
- Sport clean-cut shirts every day.
- Work in black gloves/white shoes, every day.
Determinants of Service Quality

<table>
<thead>
<tr>
<th>Determinants</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability</td>
<td>Consistency of performance and dependability</td>
</tr>
<tr>
<td>Responsiveness</td>
<td>Willingness or readiness of employees</td>
</tr>
<tr>
<td>Competence</td>
<td>Required skills and knowledge</td>
</tr>
<tr>
<td>Access</td>
<td>Approachability and ease of contact</td>
</tr>
<tr>
<td>Courtesy</td>
<td>Politeness, respect, consideration, friendliness</td>
</tr>
<tr>
<td>Communication</td>
<td>Keeping customers informed</td>
</tr>
<tr>
<td>Credibility</td>
<td>Trustworthiness, believability, honesty</td>
</tr>
<tr>
<td>Security</td>
<td>Freedom from danger, risk, or doubt</td>
</tr>
<tr>
<td>Understanding/knowing</td>
<td>Understand the customer's needs</td>
</tr>
<tr>
<td>Tangibles</td>
<td>Physical evidence of the service</td>
</tr>
</tbody>
</table>

Table 6.5

Service Recovery Strategy

- Managers should have a plan for when services fail
- Marriott’s LEARN routine
  - Listen
  - Empathize
  - Apologize
  - React
  - Notify

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