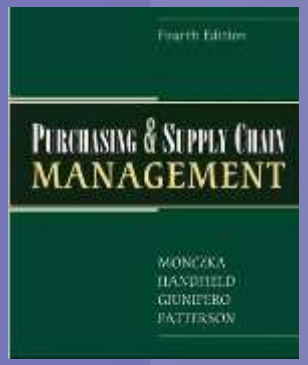
Supplier Quality Management

Chapter 8



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Chapter Overview

- Case study: Strategic **quality failure** in Global SCM
- Overview of supplier quality management
- **Factors** affecting supply management's role in managing supplier quality
- Supply quality management using a **TQM perspective**
- **Process capability**
- **Cost of quality**
- Pursuing Six Sigma supplier quality
- Using **ISO and the MBNQA** criteria

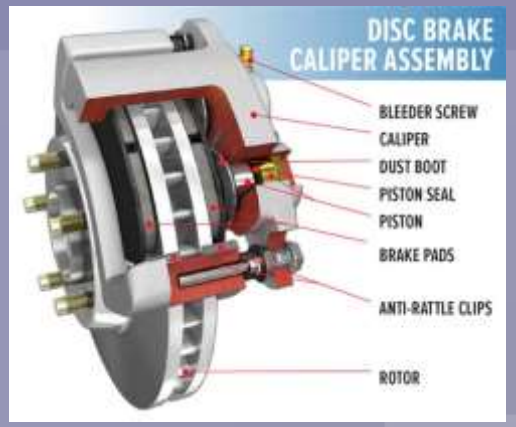
Case Study: Alpha Motors

Strategic Supplier Quality Failure in Global Sourcing

Alpha Motors (a global automotive OEM) sources nearly 65% of its components from external suppliers across Asia and Eastern Europe.

To improve cost competitiveness, Alpha Motors' procurement team decided to outsource brake caliper components to a new supplier, Sigma Components Ltd., located in a low-cost country, because it offered:

- 18% lower unit cost
- Acceptable initial quality reports
- ISO 9001 certification



Based mainly on cost savings and short-term financial targets, Sigma was awarded a single-source contract for three years.

Case Study: Alpha Motors

The Problem: Within 12 months of production

- Defect rates increased from 0.8% to 4.5%
- Assembly line stoppages became frequent
- Customer complaints related to braking noise and performance increased
- Two regional markets initiated safety investigations
- Although Sigma met contractual delivery volumes, process variation and weak continuous improvement capabilities were identified during audits.

Case Study: Alpha Motors

Procurement's Dilemma: Alpha Motors faces a strategic decision.

1. **Terminate the contract**
   - **Risk of supply disruption**
   - **Higher short-term costs**
2. **Develop the supplier**
   - **Invest time, resources, and training**
   - **No guaranteed improvement**
3. **Dual-source**
   - **Increase complexity**
   - **Reduce dependency risk**

Case Study: Alpha Motors

Think: What Went Wrong at Alpha Motors?

- **Overemphasis on cost-based sourcing:**

- **Weak supplier capability assessment**

- **Absence of supplier development strategy:** Trainings

- **Poor quality governance in outsourcing decisions:** No system to monitor

What Is Supplier Quality?

- The ability to meet or exceed current and future customer expectations or requirements within critical performance areas on a **consistent basis**
- Keys to supplier quality:
  - **Meet or exceed**
  - Current and future **requirements**
  - On a **consistent** basis

Supplier Quality Concerns

- **Supplier impact on quality:**
- **Continuous improvement**
- **Outsourcing of purchase requirements:** Depending on suppliers because of limited resources.

6 Factors: Supply Management's Role

Supply management does not control quality directly; it enables or limits it through strategic decisions.

1. The **ability** of a supplier to affect a buyer's total quality, e.g., Packaging vs Brake Supplier
2. The **resources available** to support supplier quality improvement: Time, cost,
3. Ability of a **buying firm** to practice world-class quality

Factors: Supply Management's Role

4. A supplier's **willingness** to work jointly with the buyer to improve quality

5. A supplier's **current quality levels**

6. A buyer's ability to collect and analyze quality-related **data**

A TQM Perspective

- Defining quality in terms of **customers and their requirements**
- Deming's 14 Points
- Pursuing quality at the **source**
- Stressing objective measurement and analysis
- Emphasizing **prevention** rather than detection of defects

A TQM Perspective

- **Focusing on process rather than output**
- **Basics of process capability**
- **Striving for zero defects**
- **Cost of quality:** Cost of quality is NOT the cost of making a high-quality product. It is the cost of doing things right and wrong.
- **Establishing continuous improvement as a way of life**
- **Making quality everyone's responsibility**

Quality: The Customer's Perspective

- Nonconforming supplier quality is often due to **inconsistent communication** and resultant **misunderstanding** of specifications, expectations, and requirements within the supply chain
  - Need for clear specifications and performance requirements
  - Sharing of final product requirements

Quality Concepts in SCM

Developing Clarity

- **Ability of the buying company to briefly identify, clearly define, quantify, or specify its technical and sourcing requirements.**

- **Buyer's ability and initiative to effectively communicate these requirements to the supplier**

Quality at the Source

Doing quality right where the work is done—so defects are prevented, not detected later. Product and process design

- **Early supply management involvement (ESMI)**
- **Early supplier design involvement (ESDI)**

Objective Measurement and Analysis

- Make decisions **on facts, not feelings**
- Need for a rigorous evaluation system
  - Provide feedback to support **corrective action**
  - **Track results** from improvement initiatives

Prevention of Nonconformance

- Need for **process consistency**
- Reduce **process variation**
- Reduce reliance on **appraisal**, inspection, and detection activities
- Use of **corrective action** requests

Focus on Process, Not on Output

- Move from **product** orientation **to process** orientation
- Quality processes → quality output
- Supplier must **provide evidence** of process capability
- **Structured,** companywide supplier evaluation and selection system

Focusing on Sample Inspections

- What supplier would knowingly submit a poor sample?
- How many parts did the supplier produce **to get an acceptable sample**?
- Are the **samples representative** of the process under normal conditions?

Focusing on Sample Inspections

- Did the supplier use the **same process**, methods, and materials that will be used in normal production?
- Or was the **sample made** under controlled laboratory conditions?
- Did the supplier actually **produce the sample or use a subcontractor**?
- Do the samples show evidence of **capacity or process capability**?

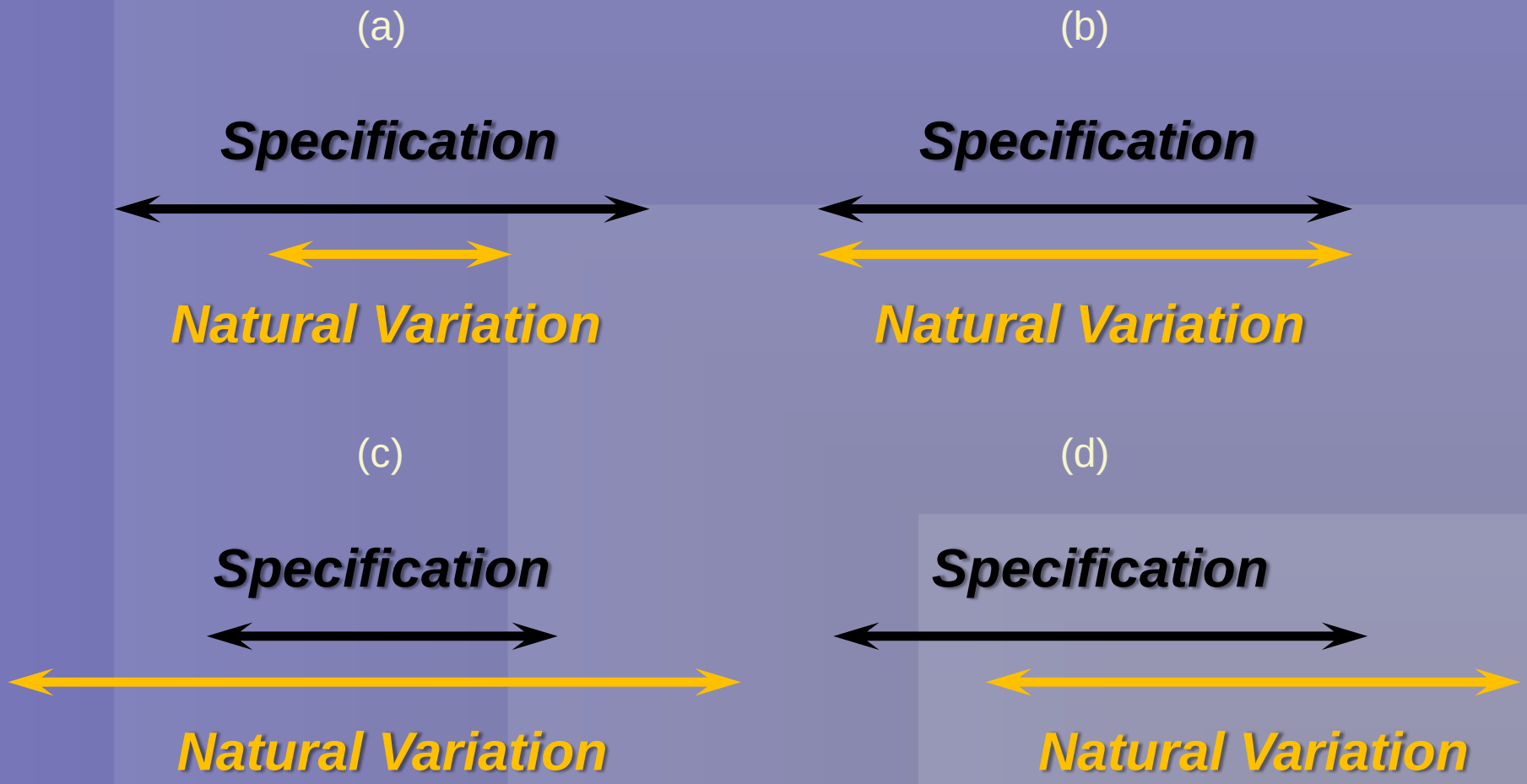
Basics of Process Capability

- Process capability is the ability of a process to generate outputs that meet engineering specifications or customer requirements
- Outputs must fall between pre-established upper and lower specification limits
- No special causes of variation exist in the process

Basics of Process Capability

- 99.73% of all output fall between ± 3 standard deviations of the process mean
- A stable process and in statistical control can be expected to produce virtually all of its output within these natural tolerance limits
- A process's natural limits must fall within specification limits to be capable

Process Capability



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Zero Defects

- Conformance to requirements (Crosby)
- Key metrics to identify improvement opportunities
- Supply base rationalization and optimization
  - Average supplier quality improves as lower performers are eliminated from the supply base

Cost of Quality

- Appraisal costs
  - Direct costs of measuring quality
- Failure costs
  - Internal – occur before product or service is provided to customer
  - External – occur following production or after customer takes possession
- Prevention costs
  - Prevent defects from occurring

Appraisal Cost Examples

- Laboratory testing of samples
- Inspection activities during production
- Supplier quality audits
- Incoming material inspections
- Other forms of monitoring

Internal Failure Cost Examples

- Troubleshooting
- Re inspection following detection of defects
- Production downtime caused by defects
- Scrap
- Process waste

External Failure Cost Examples

- Warranty costs
- Replacement of defective products
- Product liability lawsuits
- Loss of customers

Prevention Cost Examples

- Quality planning
- Equipment calibration
- Quality training
- Maintenance of a quality management system

Continuous Improvement

- Value analysis/value engineering (VA/VE)
- Supplier development
- Supply base rationalization and optimization
- Supplier incentive and reward systems

Supplier Incentives

- Longer-term contracts
- Higher share of purchase volume
- Public recognition and awards
- Shared cost savings
- Access to new technology from buyer
- Early insight to new business opportunities and product development plans

Supplier Incentives

- Early participation in new product and process development projects
- Use of buyer's supply agreements to obtain favorable pricing
- Participation in executive buyer-supplier councils
- Listed as preferred supplier with first opportunity for new business

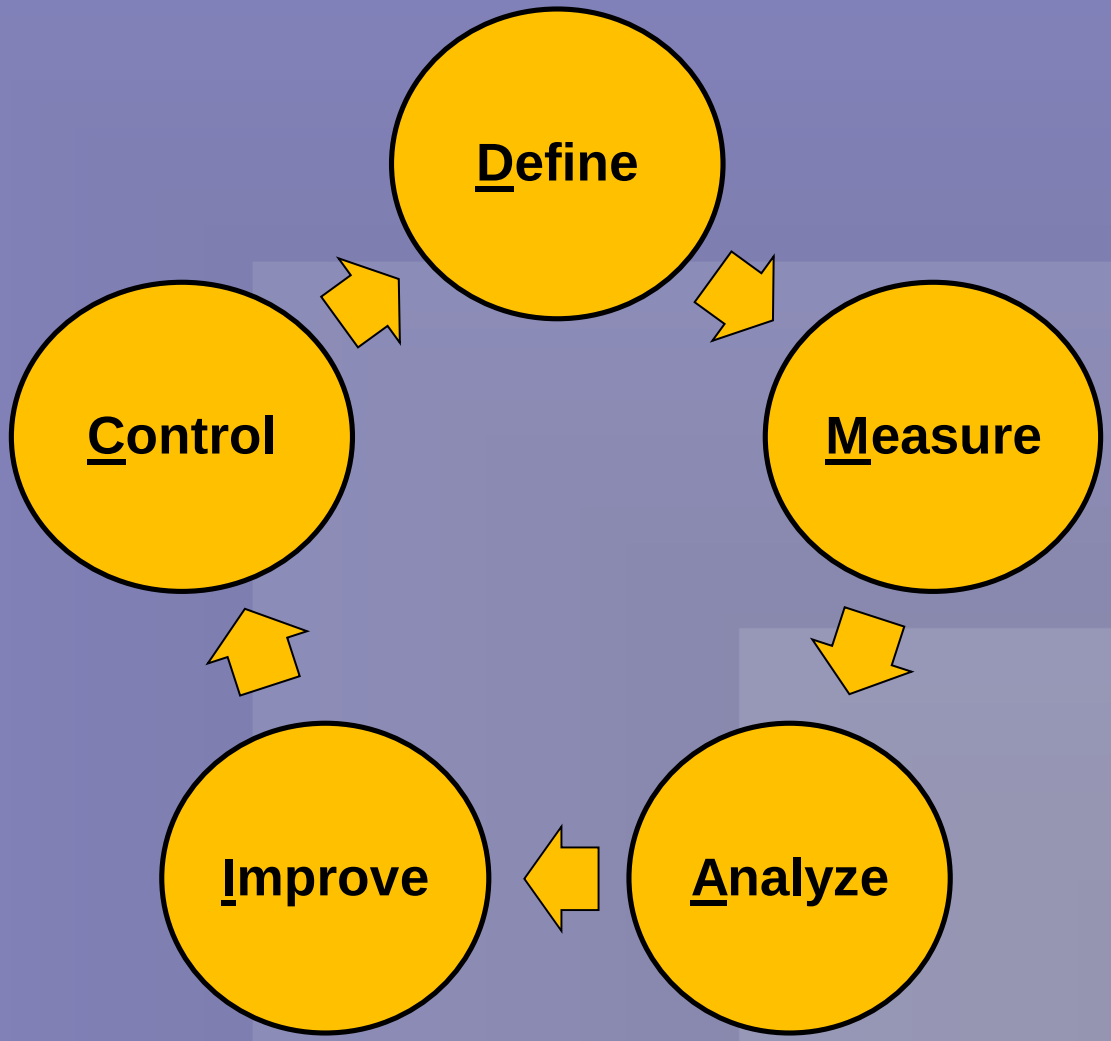
Quality: Everyone's Responsibility

- Aligned vision and goals
- Physical co-location
- Executive-level buyer-supplier councils
- Shared technologies
- Joint projects
- More collaborative buyer-supplier relationships

Six Sigma Quality

- Proven quality principles and techniques
- Virtually error-free business performance
- Expressed as 3.4 errors (or defects) per million opportunities (DPMO)
- Increasing expectations from customers
- Focus on defect prevention, cycle time reduction, and cost savings
- Use of Six Sigma Black Belts

The DMAIC Model



The DMAIC Model

- Define improvement activity and goals
- Measure existing system, establish metrics, and identify performance baseline
- Analyze system and develop hypotheses
- Improve – develop ideas, test solutions, and implement new process, structure, and system
- Control – measures and procedures to ensure system stays in control

Using ISO and MBNQA Criteria

- **Widely accepted quality management frameworks**
  - **ISO 9000:2000**
  - **ISO 14000**
  - **Malcolm Baldrige National Quality Award**
- **Criteria are often used as the basis for supplier certification programs**

ISO 9000:2000

- Originally developed in the European Common Market in 1987
- Updated in 1994 and 2000
- Expected to be updated again in 2008
- Third-party registration process
- Internationally accepted and recognized quality process standards

Eight Principles of ISO 9000:2000

- Customer focus
- Leadership
- Involvement of people
- Process approach
- System approach to management
- Continual improvement
- Factual approach to decision-making
- Mutually beneficial supplier relationships

Buyer's Benefits of ISO 9000:2000

- Few firms have sufficient resources to develop and implement their own comprehensive supplier certification audits
- Supplier assumes responsibility for meeting the ISO 9000:2000 standards and paying its own registration fees
- Supplier demonstrates higher quality

ISO 14000

- Established in 1993 to promote environmental protection and pollution prevention
- Used to analyze a supplier's ability to proactively manage its environmental impact
- Range from environmental management systems to addressing auditing, labeling, and product standards

ISO 14000

- Set of voluntary standards
- Classifications
  - Process-oriented standards
  - Product-oriented standards
- But, it does ***not***:
  - Build on existing governmental regulations
  - Establish emissions and pollution levels
  - Detail any specific testing methods

Benefits of ISO 14000

- Fewer pollutants generated
- Reduced liability risk
- Improved regulatory compliance
- Better public and community relations
- Lowered insurance premiums
- Enhanced profitability through:
  - Improved resource management
  - Reduced waste generation

The MBNQA

- Established in 1987
- A de facto definition of TQM and competitive set of criteria
- More comprehensive set of quality-related criteria than ISO 9000:2000
- Implies that an organization excels not only in quality management but also in quality achievement

The MBNQA

- Much of current application is for internal use as a quality management tool and not for award purposes
- May take 8 – 10 years to adequately prepare a competitive quality system
- Built upon a continuous improvement philosophy
- Both process and results oriented

MBNQA Criteria Items

- **Leadership**
  - **Organizational leadership**
  - **Public responsibility and citizenship**
- **Strategic planning**
  - **Strategy development**
  - **Strategy deployment**
- **Customer and market focus**
  - **Customer and market knowledge**
  - **Customer satisfaction and relationships**

MBNQA Criteria Items

- **Information and analysis**
  - **Measurement of organizational performance**
  - **Analysis of organizational performance**
- **Human resource focus**
  - **Work systems**
  - **Employee education, training, and development**
  - **Employee well-being and satisfaction**

MBNQA Criteria Items

- **Process management**
  - **Product and service processes**
  - **Support processes**
  - **Supplier and partnering processes**
- **Business results**
  - **Customer focused results**
  - **Financial and market results**
  - **Human resource results**
  - **Supplier and partner results**
  - **Organizational effectiveness results**

Supplier Certification at Alcoa