

# OMGT1039 Operations Management

## Week 4 Quality management and Statistical Process Control

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## Lecture Outline

- ◆ Defining Quality
  - ◆ Implications of Quality
  - ◆ Quality Award
  - ◆ Cost of Quality (COQ)
- ◆ Total Quality Management
- Statistical Process Control (SPC)
  - ◆ Control Charts for Variables (x-Charts, R-Charts)
  - ◆ Control Charts for Attributes (p, c charts)
- Process Capability
  - ◆ Process Capability Ratio (Cp)
  - ◆ Process Capability Index (Cpk)

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### ***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

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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

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### **Quality Award**

- ◆ **Malcolm Baldrige Quality Award:** Established in 1988 by the U.S. government. Designed to promote TQM practices
- ◆ **Australia**
  1. JM Jurun award
  2. Kevin Foley award
  3. Shilkin award
- ◆ **In Europe:** European Foundation for Quality Management

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### **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

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### **International Quality Standards**

- ◆ **ISO 9000 series (Europe/EC)**
  - ◆ Common quality standards for products sold in Europe (even if made in U.S.)
- ◆ **ISO 14000 series (Europe/EC)**  
Environmental standards

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### **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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### **Deming's Fourteen Points**

- 1. Create consistency of purpose**
- 2. Lead to promote change**
- 3. Build quality into the product; stop depending on inspections**
- 4. Build long-term relationships based on performance instead of awarding business on price**
- 5. Continuously improve product, quality, and service**

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### **Deming's Fourteen Points**

- 6. Start training**
- 7. Emphasize leadership**
- 8. Drive out fear**
- 9. Break down barriers between departments**
- 10. Stop haranguing workers**
- 11. Support, help, and improve**

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### **Deming's Fourteen Points**

- 12. Remove barriers to pride in work
- 13. Institute education and self-improvement
- 14. Put everyone to work on the transformation

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### **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

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### **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

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