09 - 10| Quality Management

OM 201
Principles of operations management

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Lecture Outline

Topics

- Nature of quality
- Total quality management
- Fundamental quality tools

Learning objectives

- To understand the importance and strategic role of quality management
- To be able to apply the statistical tool in quality improvement and analysis

Reference

- Roberta Russell & Bernard W. Taylor, (2009), *Operations Management along the supply chain* (CHAPTER 2) Ed 6, John Wiley &Son

Some say…

"Good is not good where the better is expected"

"No problem is a problem"

"When I hear, I forget.
When I see, I remember.
When I do, I understand"

What is *Quality*?

Which one has a higher quality?

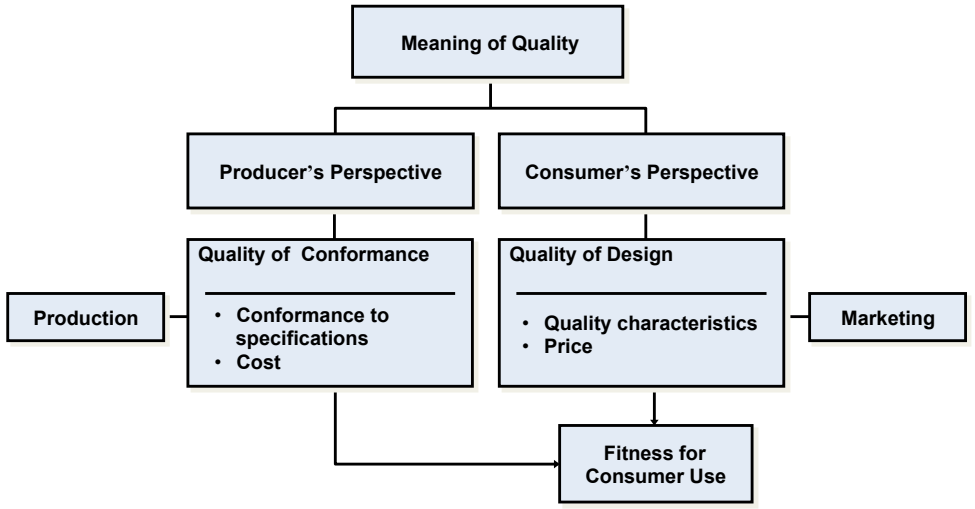
Source: Russell and TaylorIII (2005)

Meaning of Quality: Consumer's Perspective

- **Fitness for use**
  - how well product or service does what it is supposed to
- **Quality of design**
  - designing quality characteristics into a product or service
- A Mercedes and a Ford are equally "fit for use," but with different design dimensions

Source: Russell and TaylorIII (2005)

Meaning of Quality



Quality Measure in Manufacturing Industry

- Characteristics of products
- Examples:

Products	Quality Characteristics
Metal ring	Diameter; thickness
Box of cereal	Weight
Bag of MaMa	Weight
Body lotion	Viscosity; color
Cosmetic	Color

Quality Measure in service industry

- Nature of defect is different in services
- Service defect is a failure to meet customer requirements
- Example of Quality Measure
  - Average waiting time or service time,
  - Average queue length
  - customer satisfaction
  - On time delivery
  - Cleanliness

"quickest, friendliest, most accurate service available."

Jim our Fedex Gator

Dimensions for Quality Manufactured Products

Performance	• basic operating characteristics of a product; how well a car is handled or its gas mileage
Features	• "extra" items added to basic features, such as a stereo CD or a leather interior in a car
Reliability	• probability that a product will operate properly within an expected time frame; that is, a TV will work without repair for about seven years
Conformance	• degree to which a product meets pre–established standards
Durability	• how long product lasts before replacement?
Serviceability	• ease of getting repairs, speed of repairs, courtesy and competence of repair person
Aesthetics	• how a product looks, feels, sounds, smells, or tastes?
Safety	• assurance that customer will not suffer injury or harm from a product; an especially important consideration for automobiles
Perceptions	• subjective perceptions based on brand name, advertising, and like

Dimensions for Quality Services

Time and timeliness	• how long must a customer wait for service, and is it completed on time? • is an overnight package delivered overnight?
Completeness:	• is everything customer asked for provided? • is a mail order from a catalogue company complete when delivered?
Courtesy:	• how are customers treated by employees? • are catalogue phone operators nice and are their voices pleasant?
Consistency	• is same level of service provided to each customer each time? • is your newspaper delivered on time every morning?
Accessibility and convenience	• how easy is it to obtain service? • does service representative answer you calls quickly?
Accuracy	• is service performed right every time? • is your bank or credit card statement correct every month?
Responsiveness	• how well does company react to unusual situations? • how well is a telephone operator at able to respond to a customer's questions?

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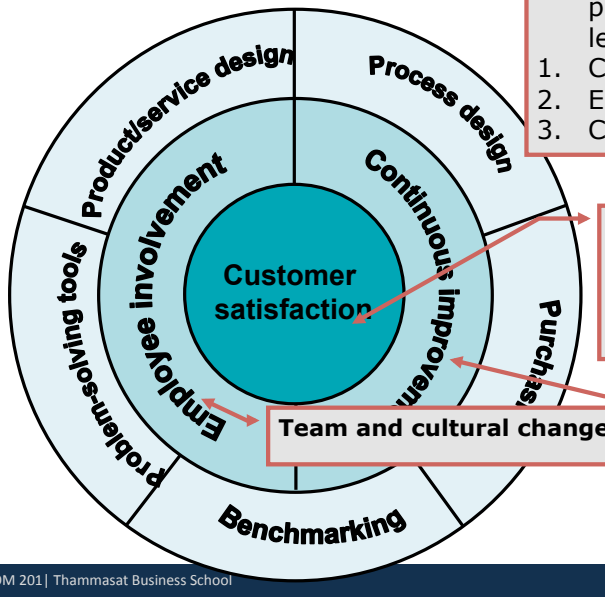
Total Quality Management (TQM)



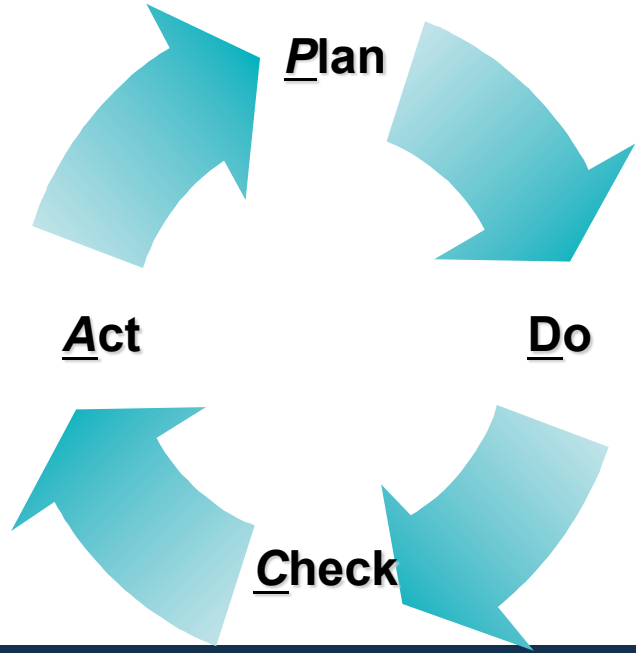
Philosophy that emphasizes on 3 principles for achieving high level of quality

1. Customer Satisfaction
2. Employee involvement
3. Continuous improvement

-Conformance to specification
- value
- fitness for use
- support
- impression

-" *Kaizen*"
- keep improving
- always have some room for improvement

Problem-Solving Process ***Deming Wheel (PDCA)***



PLAN – DO – CHECK – ACT

Plan
- Team selects a process
- Assess existing performance → use graphical tools
- Write out improvement plan and goal

Do
- Implement plan and monitor the plan
- Collect data & document data

Check
- Analyze collected data: use SPC (Statistical process control)
- Check against the goal that proposed in *Plan*

Act
- If results are satisfied, implement the process and look for other improvement area
- If not, plan out the new improvement plan
- ACT becomes STANDARDIZED

WORKSHOP CASE

TQM at State University

"Having to do more, better, with less"

Fred Mcmahan

GM

PONTIAC

Common Concerns . . .

How can we speed up the process?

How can we get cost down?

How can we reduce our customer's waiting time?

How can we eliminate waste?

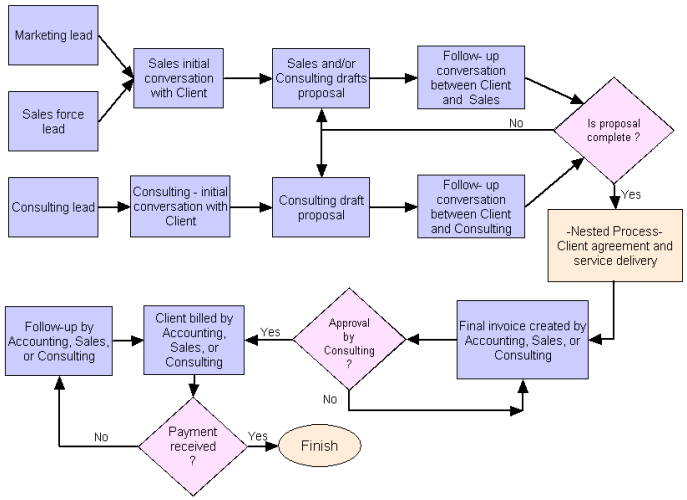
How can we deliver our service faster?

Problem Solving Tools & Techniques

- Process Analysis / Flow Chart
- Check sheet
- Run chart
- Pareto chart
- Scatter Diagram
- Fishbone chart (cause-and-effect diagram)

Process Analysis / Flow Chart

Provide big picture of how process works



Example of Flowchart of the Sales Process for a Consulting Company

Check Sheet

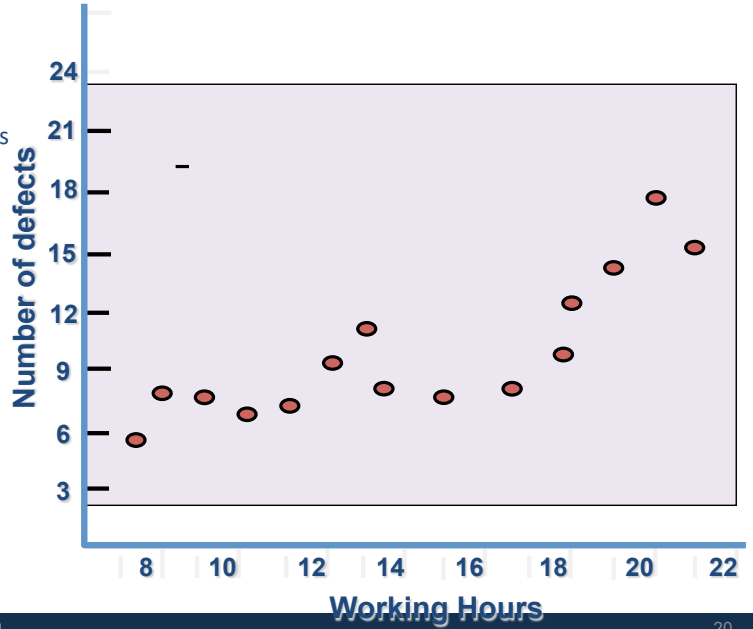
COMPONENTS REPLACED BY LAB
TIME PERIOD: 22 Feb to 27 Feb 2002
REPAIR TECHNICIAN: Bob

TV SET MODEL 1013

Integrated Circuits	𝍸
Capacitors	𝍸 𝍸 𝍸 𝍸 𝍸 II
Resistors	II
Transformers	𝍸
Commands	
CRT	I

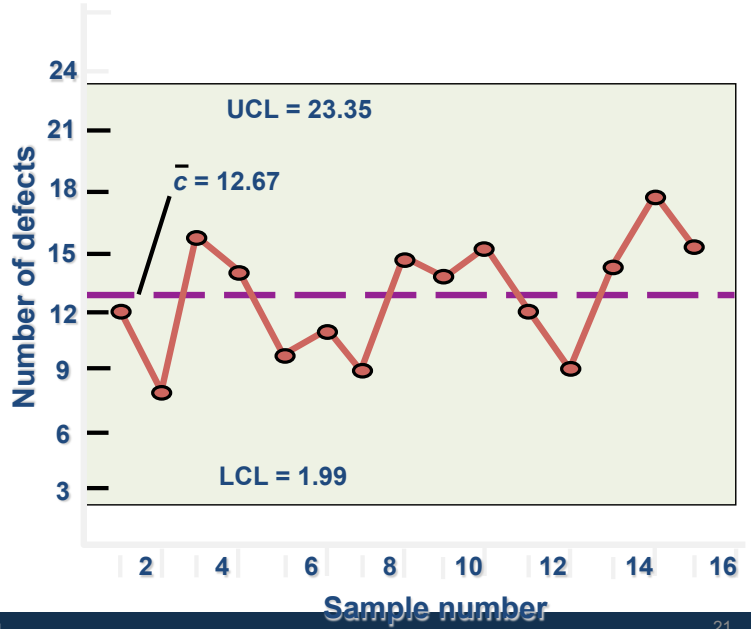
Run Chart

Show how variable / interested response has changed over time



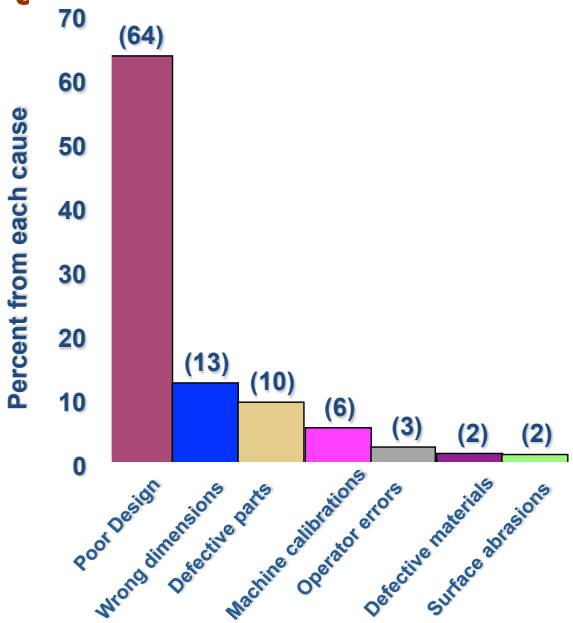
Control Chart

Identify unusual or out of control process with consideration of process variation



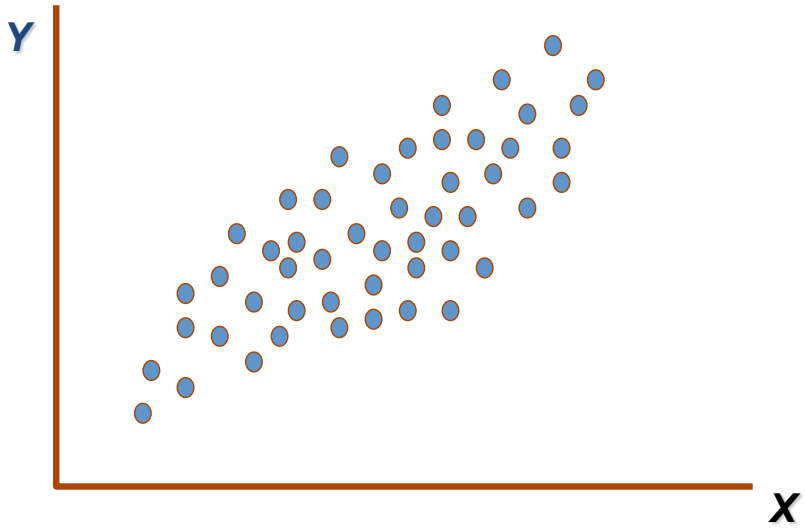
Pareto Chart

Bar chart that shows majority of problems with minority causes



Scatter Diagram

Show correlation and relationship of two variables



Fishbone / Cause-and-Effect Diagram