Lecture #15

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MichiganTech

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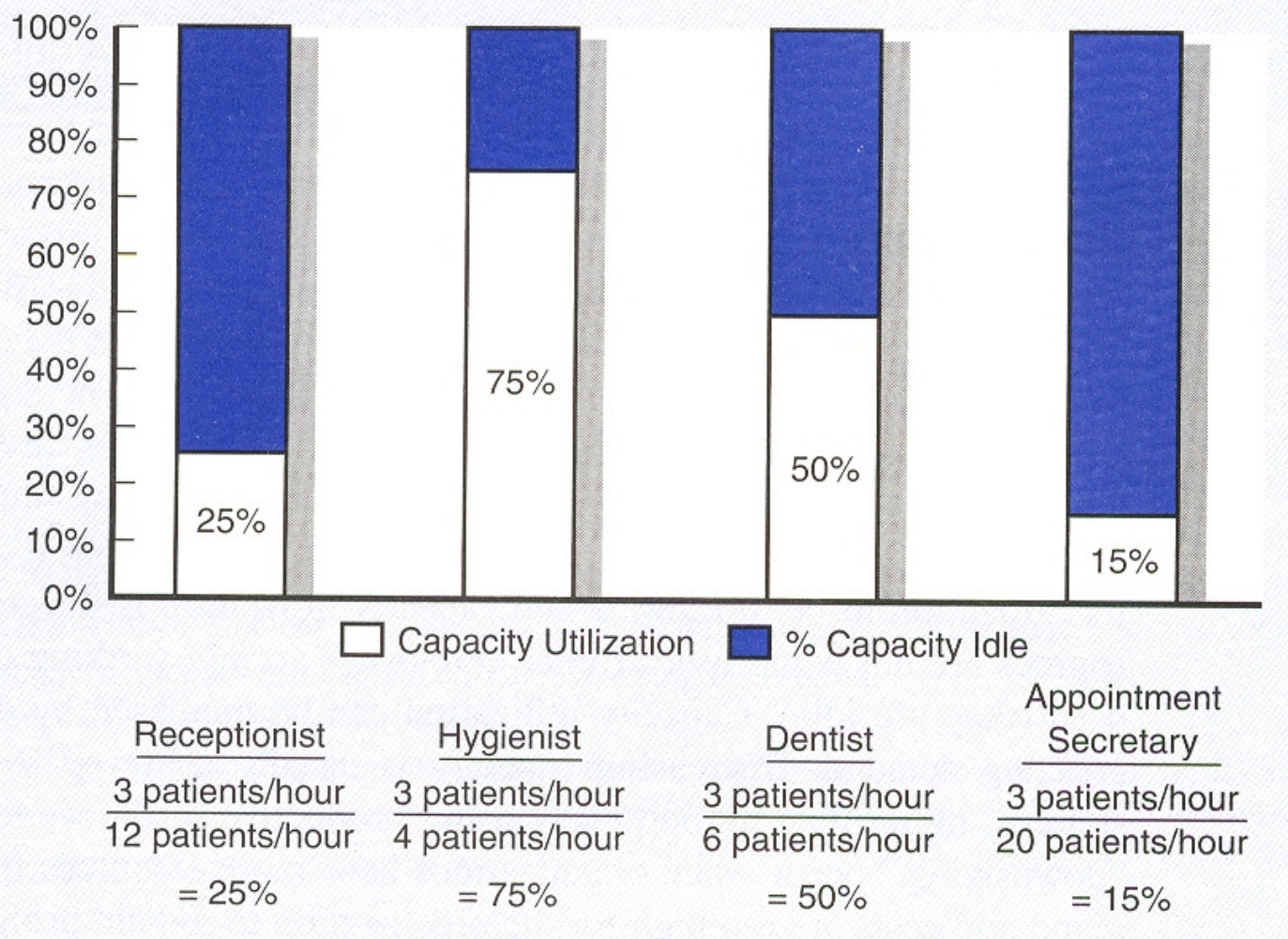
Michigan Technological University

Dentist's Office



Capacity Utilization

- Three Ways to Change Capacity Utilization (efficiency approach):
  - Change the Capacity Required (Demand)
  - Change the Time Available
  - Change the Processing Time
- Effectiveness approach

More Org. Performance Measures

- Customer Satisfaction
  - Customer Retention/Loss
  - New Customers
  - Sales Volume and Market Share
  - Complaints
  - ?????? – good measures??
- Sears study – customer complaints

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More Org. Performance Measures

- Customer Cancellation and No-Show Rates
- Employee Satisfaction
- Flexibility/Bandwidth of the Organization – Agility
- Surveys

Measuring Yield

$$\text{Yield}(\%) = \frac{\text{Good Outputs}}{\text{Total Outputs}}$$

$$\text{Yield}(\%) = \frac{\text{Number of Sales}}{\text{Number of Calls}}$$

$$\text{Yield}(\%) = \frac{\text{Number of Sales}}{\text{Number of People Who Visit Website}}$$

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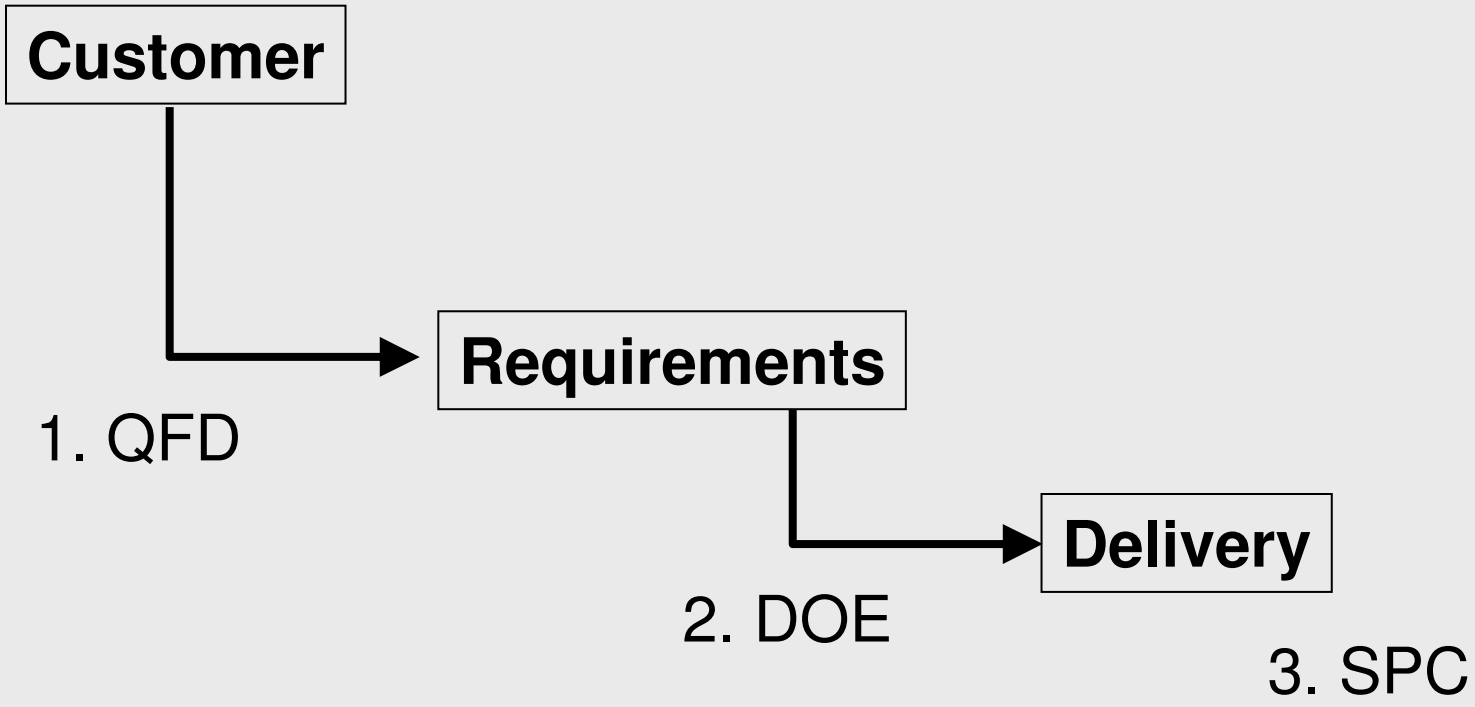
More Measures

- Dependable Delivery
- Waiting Time
- Financial Measures
- ???

From Last Time…



Some Philosophical Basics

- Old View
  - Quality & Productivity conflict
- Deming
  - Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs
  - New Philosophy
  - Role of Management

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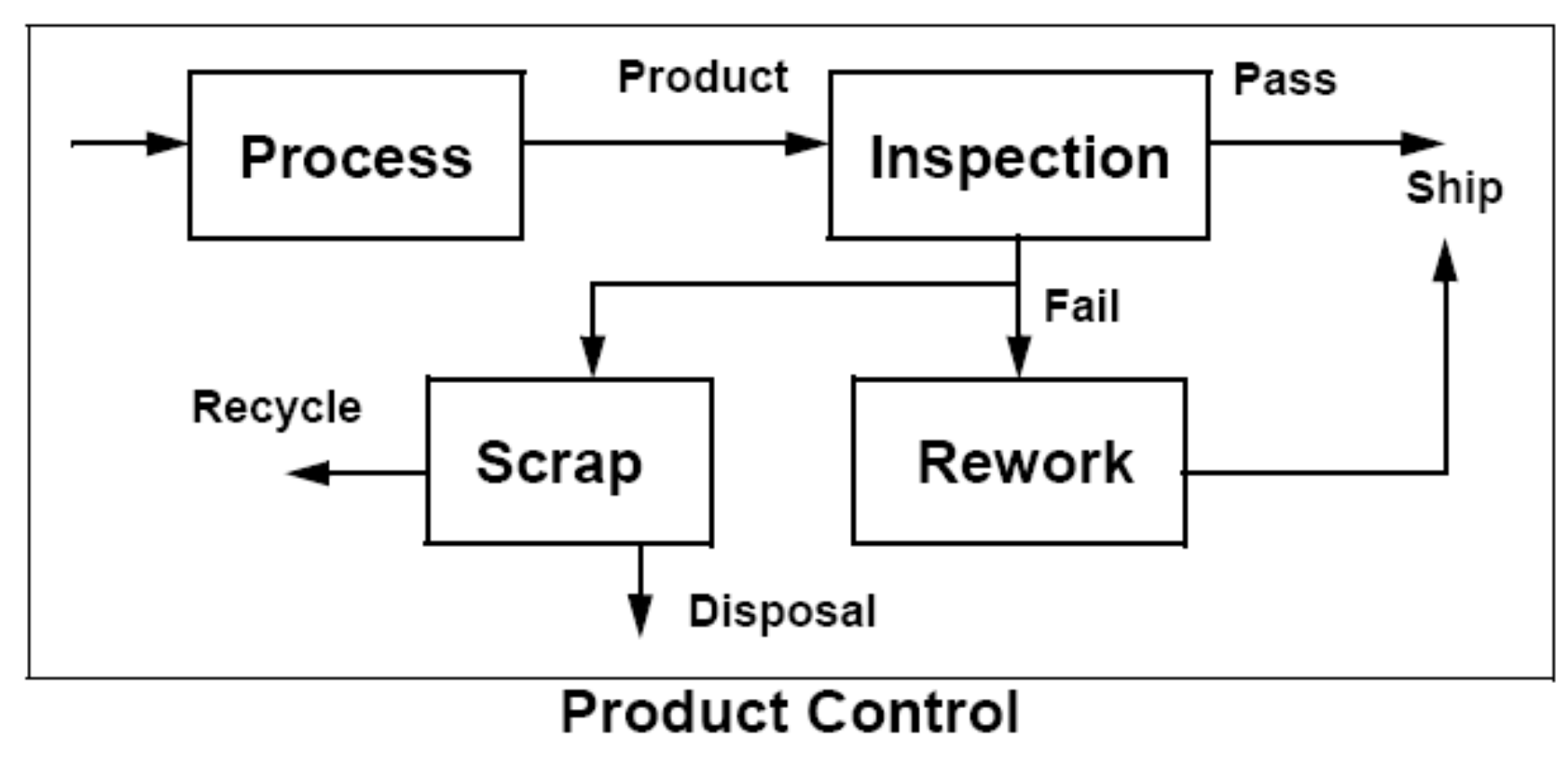
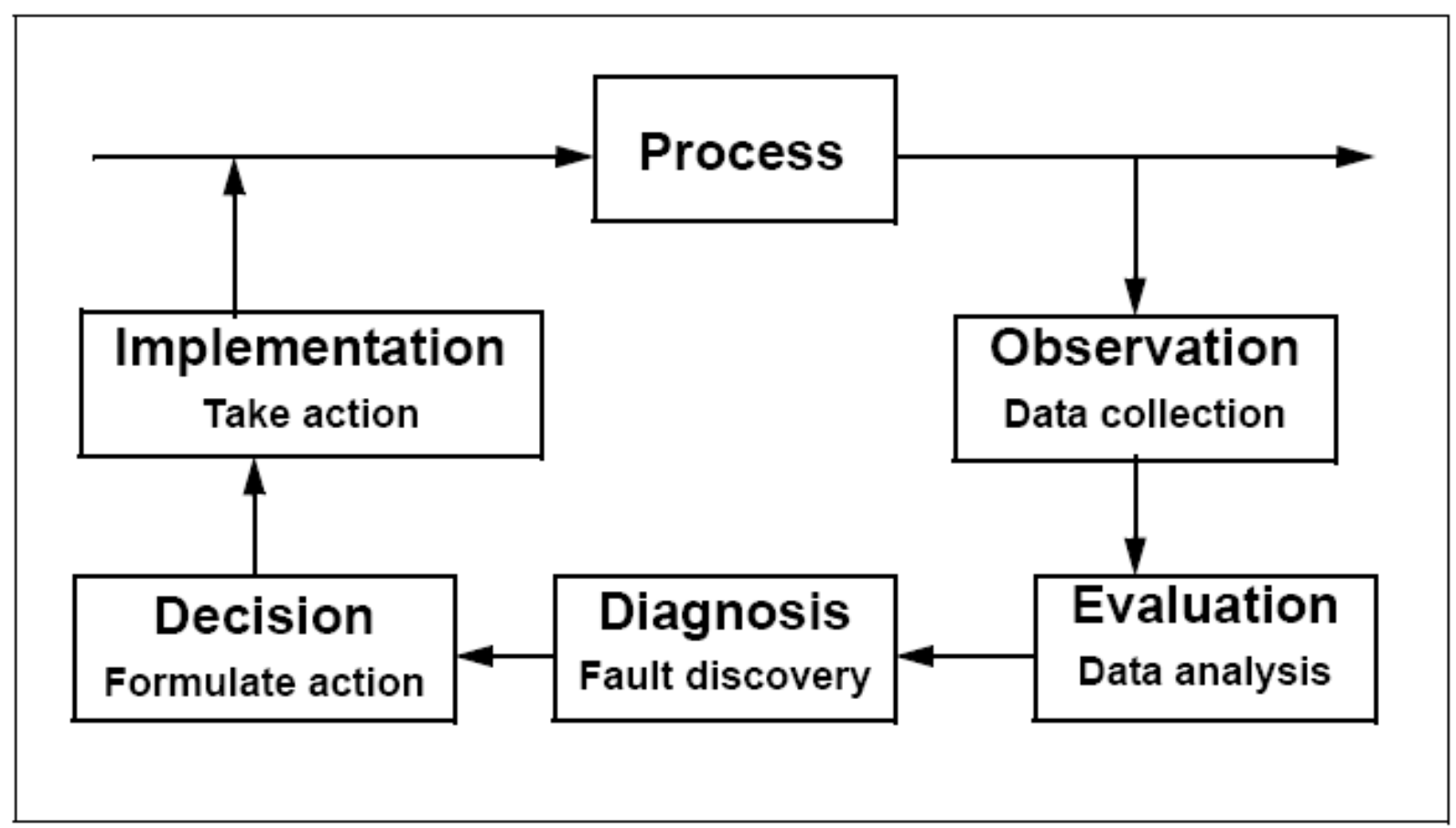
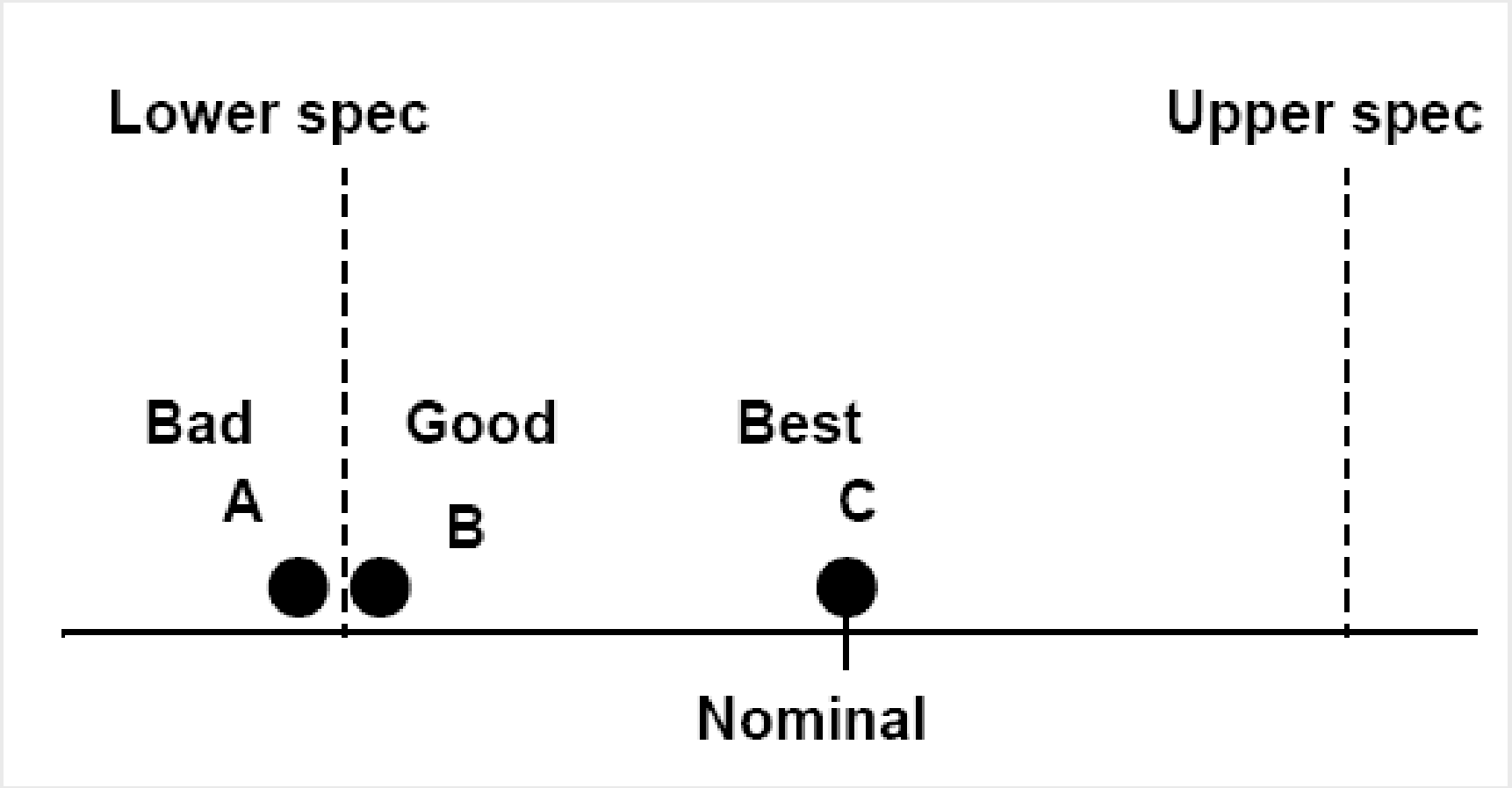

Process
Product
Inspection
Pass
Ship
Fail
Recycle
Scrap
Rework
Disposal
Product Control

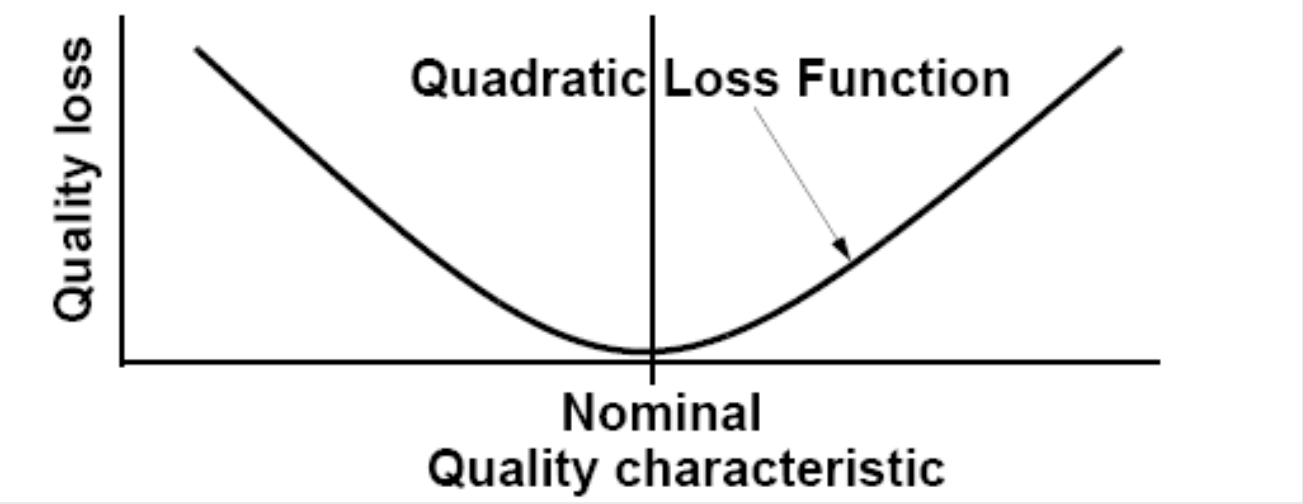


Process Control


Lower spec
Upper spec
Bad
Good
Best
A
B
C
Nominal

Taguchi's Loss Function

- Quality Loss - "Loss imparted to society during product use as a result of functional variation and harmful effects."



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Variation

- Focus on variation in function
  - Outer Noise - external source effects
  - Inner Noise - internal changes
  - Variational Noise: Process uncertainties
- Process variation
  - Common cause variation affects every service process outcome – often produce normal pattern of variability
  - Special cause variation

Importance of Quality

- Must produce goods and services that are desired by customers, rather than sell just what we produce – requires a customer focus
- Benefits
  - Improved Customer Loyalty
  - Higher Market Share
  - Improved competitive position (cost, profit)

Quality Design

- **Quality Function Deployment (QFD)**
  - Developed in Japan to provide customer input at the product design stage
  - The process results in a matrix, referred to as a "house of quality", for a particular product that relates customer attributes to engineering characteristics.
  - Can use to find the features of the service process

Service Package Features

Service Package Feature	Attribute or Requirement	Measurement	Nonconformance Corrective Action
Supporting facility	Appearance of building	No flaking paint	Repaint
	Grounds	Green grass	Water grass
	Air-conditioning and heating	Temperature maintained at 68° ± 2°	Repair or replace
Facilitating goods	TV operation	Reception clear in daylight	Repair or replace
	Soap supply	Two bars per bed	Restock
	Ice	One full bucket per room	Restock from ice machine
Explicit services	Room cleanliness	Stain-free carpet	Shampoo
	Swimming-pool water purity	Marker at bottom of deep end visible	Change filter and check chemicals
	Room appearance	Drapes drawn to width of 3 ft	Instruct maid
Implicit services	Security	All perimeter lights working	Replace defective bulbs
	Pleasant atmosphere	Telling departing guests "Have a nice day"	Instruct desk clerk
	Waiting room	No customer having to wait for a room	Review room cleaning schedule

Quality Service Implementation

- Poka-yoke (fail-safing) (idiot-proofing)
  - Shingeo Shingo: low-cost, in-process, quality-control mechanisms and routines can achieve high quality without costly inspection
  - Errors occur, not because employees are incompetent, but because of interruptions in routines or lapses in attention

Quality Service Implementation

- **Poka-yoke Examples**
  - Height bar at amusement park
  - French fry scoop at McDonald's
  - Bank teller's eye-contact requirement
    - enter customer's eye color on a checklist
  - Automatic spell checking in word processing software

Airlines use this poka-yoke device to alert passengers to the size limits of carry-on luggage. © Myrleen Ferguson Cate/PhotoEdit