Basics of Quality Management

Lecture 1

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Consultation: Wednesdays 12:00-14:00

Aims and objectives

- Getting students acquainted with the basics of quality management and forming their attitude towards (quality) management topics
- Main topics to be covered:
  - Defining quality, evolution of quality management
  - Quality management system
  - Principles of Total Quality Management, process approach
  - Quality management tools and methods

	Topics to be discussed, readings required for the class, other assignments
Week 1	Basics and evolution of quality management
Week 2	Total quality management, total commitment, leaders-managers
Week 3	GTK Sport day
Week 4	Customer focus, product-service, QFD
Week 5	Continuous improvement models
Week 6	Six Sigma, Lean management
Week 7	**1st midterm**
Week 8	Tools and techniques of continuous improvement
Week 9	Formalised quality management systems, ISO, audit
Week 10	TDK
Week 11	Reliability theory
Week 12	Self-assessment, EFQM, awards, cost of quality
Week 13	Statistical process control
Week 14	**2nd midterm**
Week 15	**Repeat midterm**

Requirements – Basics of QM

- Midterm tests: week 7 and 14, time and place of the lecture and practice
- Attendance at practices and participate in the project works: 70 % (min. 7 practices)

- Final grade:
  - ✓ Min. 27 points from the two tests (30-30 points), each min. 6 points
  - ✓ Max. 40 points from practices (max 6 points/practice, above sum. 54 points, plus 7 points given to the midterms' results)
  - ✓ For the fulfilment of the course, students have to get at least 50 points from the practices and midterms together.

- HVO
- edu.gtk.bme.hu
- plus points sometimes for being active

Requirements – Basics of QM

- Scores and grades:
  0-49 (1)
  50-61 (2)
  62-74 (3)
  75-87 (4)
  88-100 (5)

- Problems – administer the points (moodle or neptun)

- Demonstrators – helping at practices

Requirements – QM, erasmus

- Midterm test: week 7, time and place of the lecture and practice (repeat – week 8, Wednesday, 8:30, QB307)
- For better and more practice-oriented knowledge – practices after lectures

- Final grade:
  - ✓ 50-50 points (min. 40-40%)

- edu.gtk.bme.hu
- plus points sometimes for being active and for practices

Agenda for today

- What is „quality”? How can be the term defined?
- What have been the main stages in the evolution of quality management?
- Quality Management Schools

The importance of quality

- Do not hear much about it except when things go wrong
  - ✓ Medical errors that result in death
  - ✓ Software glitches that cause products fail
  - ✓ Quality problems in the food supply chain

The importance of quality

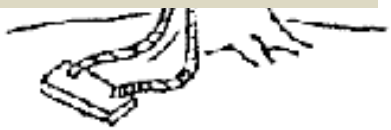
- General Motors (article1,article2):
  faulty ignition switches

- More interested in cost reduction than in improving quality, BUT intelligent customers…

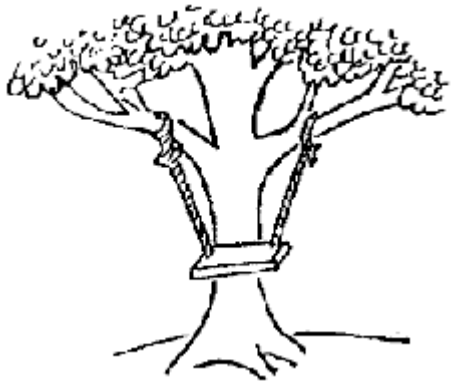
How can a company expect to stay in business if no connection is made between what the customer wanted and what the company provides?

As requested by SALES

As analyzed by MARKETING



As ENGINEERING designed it



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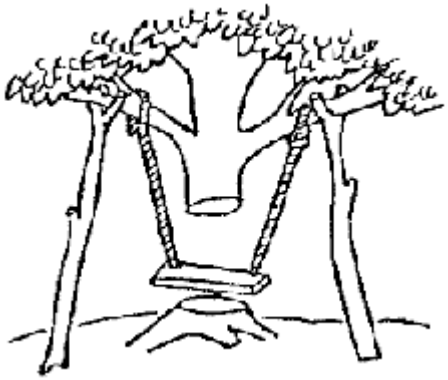
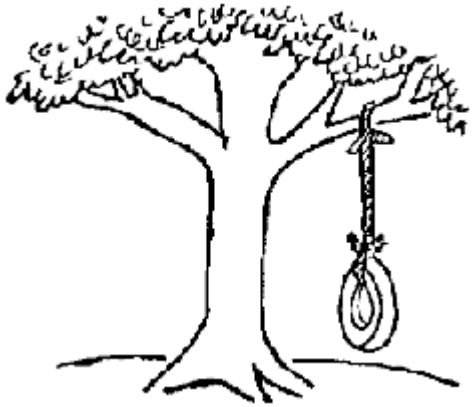


As installed by FIELD ENGINEERS



As CUSTOMER wanted

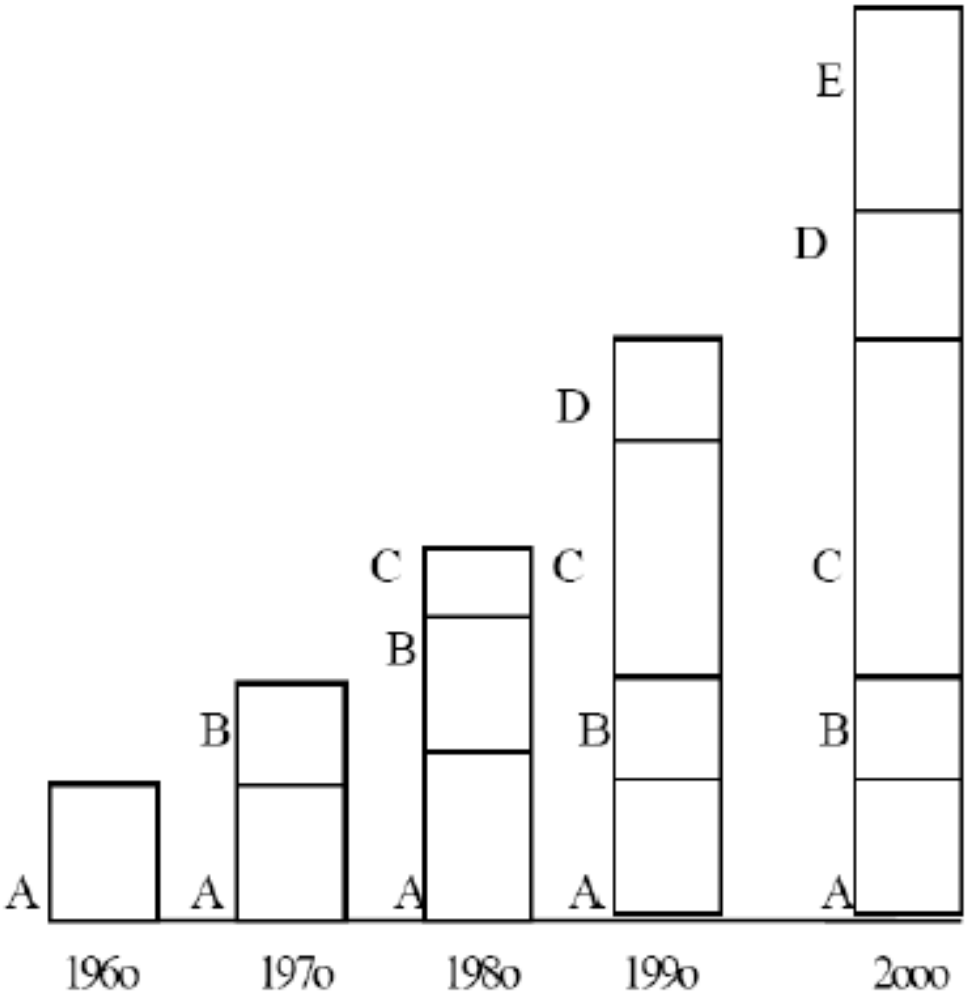
Quality

What quality means to you?

Quality

"a subjective term for which each person has his or her own definition"

The development of the interpretation of quality



E= compliance with corporate culture, environmental and social expectations

D= compliance with the customer's hidden expectations

C= compliance with the customer's needs

B= compliance with practical needs

A= compliance with the standard

Quality

- "conformance to requirements" (Crosby, 1979)
- "the degree of conformance to a standard" (Wayne, 1983)

Quality

- "products and services that meet or exceed customers' expectations" (Kano, 1984)
- "fitness for use" (Juran, Gryna, 1988)
- "value to some person" (Weinberg, 1994)

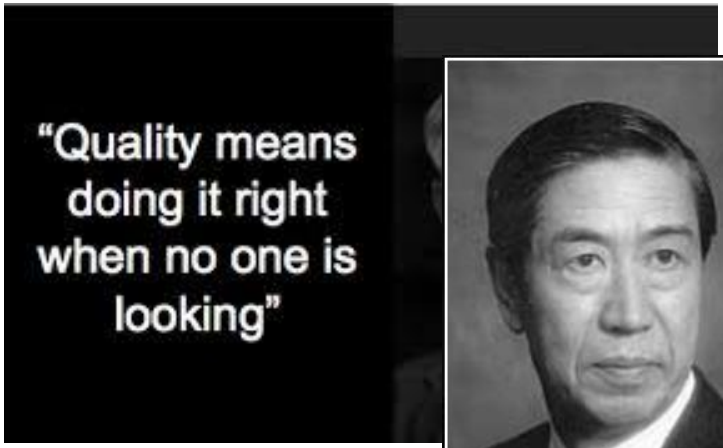
Quality

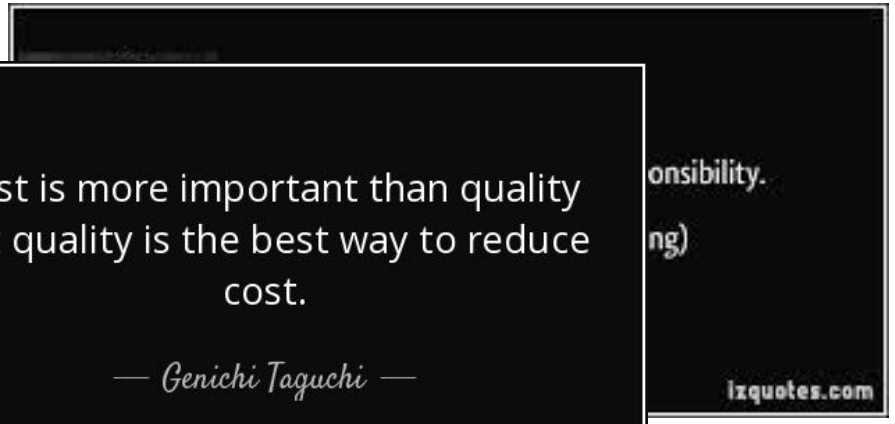
- *Harvey and Knight (1996):*
  - ✓ Quality viewed as "**exceptional**", very high standard
  - ✓ Quality viewed in terms of "**consistency**" in the process
  - ✓ Quality viewed in terms of achieving **customer satisfaction**
  - ✓ Quality viewed in term of **value for money**
  - ✓ Quality viewed as "**transformative**"

Quality

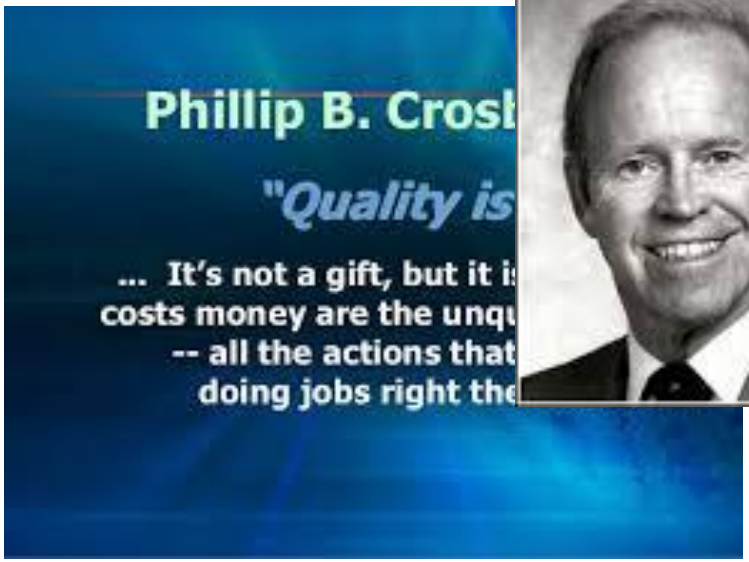
- "the degree to which a set of inherent characteristics fulfills requirements" *(ISO 9000:2005)*

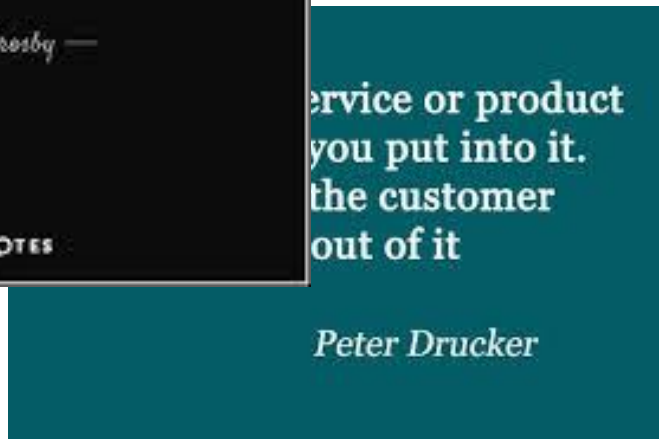
- "the characteristics of a product or service that bear on its ability to satisfy stated or implied needs" *(American Society for Quality)*





[The cost of poor quality]





Quality

- The attitude of ”It’s good enough” is simply not good enough in today’s world.
  - ✓ Customer expectations
  - ✓ Standards
  - ✓ Law

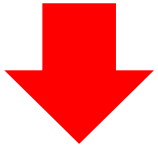
Why is it hard to define quality?

- You know quality when you see it
- Quality is a function of brand
- Quality is a passing grade
- Quality is perfection
- Quality is the absence of problems
- Quality is zero defect code
- Quality is acceptable performance
- Quality is meeting goals
- Quality is meeting requirements

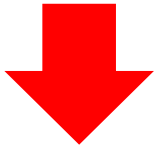
- ”The first rule of customer service: When something goes wrong, apologize.” (Marinova, D., Singh S. K., Singh, J.)
- ”Clients care about solutions, not apologies.” (the chairman and senor managing director of Accenture’s Australia and New Zealand businesses, Bob Easton)

Quality is important!

Fast and complex world



Hard to solve problems



Teamwork + quality tools

The ideal organization satisfies its customers, adapts shortly to new opportunities, reduces the risk, increases income!

Organizations should focus on quality!

Why is quality important?

- The quality
  - maximizes customer value,
  - adapts to changing (increasing) customer needs,
  - eliminates unnecessary activities, saves money,
  - is beneficial to society.

It's time to put Quality at the heart of every organisation.

https://www.youtube.com/watch?v=jYj_R4oCTPI

How can we measure quality?

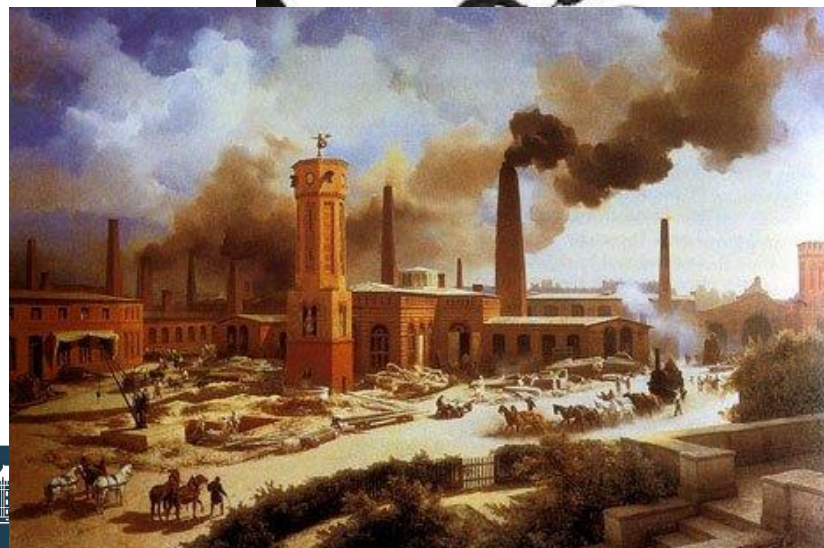
- How can we measure quality?
- What are the distinctive characteristics?
- Who and where states the needs?
- What kind of need is a self-evident?
- What kind of need is obligatory?

Origins of quality

- Babylonia: Hammurabi
- Egypt: pyramids, process control
- Greece: temples' design
- Julian and Claudian reigns: stated goals for their network of roads:
  - ✓ directness,
  - ✓ rapidity,
  - ✓ durability,
  - ✓ ease of maintance.

Origins of quality

- Skandinavian shipbuilders
- Middle Ages Cathedral builders
- 13th-19th: mark or symbol
- After the Industrial Revolution: quality and process control



Evolution of QM systems

- Total Quality Management (TQM)

- -

- Quality assurance and quality management systems
- (Statistical) quality control
- Quality inspection

1. Quality inspection

- F. W. Taylor: the role of in
- The Control of Quality in
- Narrow activities: counting,
- Simple inspection based syst
  one or more characteristics – st
- Dedicated staff employed specifically for the purpose or self-inspection
- Do not conform the specification?
- After-the-event screening process

1. Quality inspection

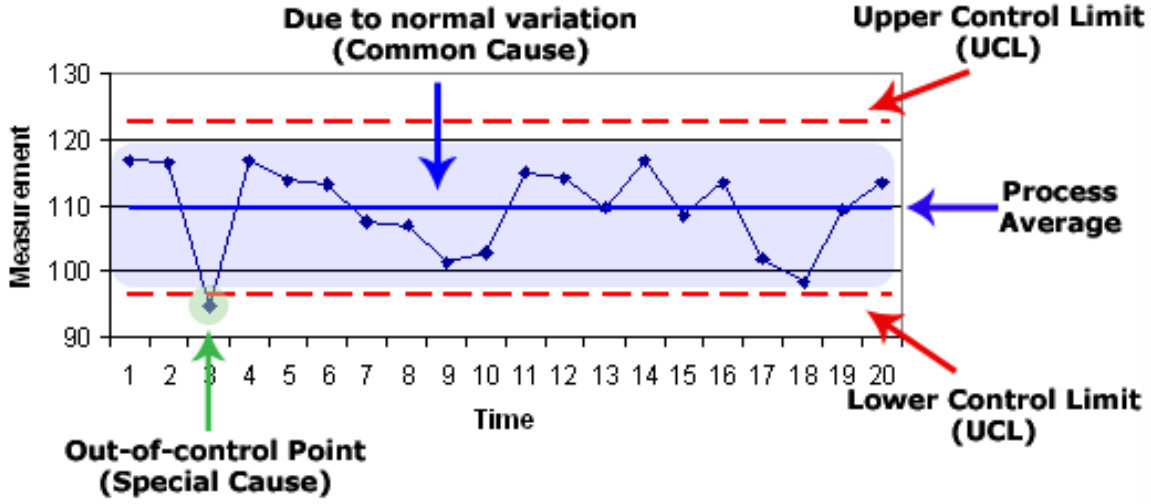
Feature	Quality inspection
Primary concern	Detection of defects
View of quality	A problem to be solved
Emphasis	Product uniformity
Methods	Gauging and measurement
Role of quality professionals	Inspection, sorting, counting, grading
Responsible for quality	Inspection department
Philosophy	Good quality can be inspected into the product

2. (Statistical) quality control

- Economic control of quality of manufacured product
- Shewhart, investigating problems of quality
- Quality control goes beyond inspection:
  - ✓ Establishes standards based on customers
  - ✓ Ensures the conformance with them, poor quality is evaluated
  - ✓ Takes actions if needed
  - ✓ Plans to prevent nonconformance

2. (Statistical) quality control

- Statistical quality control
  - ✓ Acceptable variation from fluctuations – Shewhart's graphical technique
  - ✓ Acceptance sampling – 100 % inspection (risks)



2. Statistical quality control

Feature	Statistical quality control
Primary concern	Control
View of quality	A problem to be solved
Emphasis	Product uniformity with reduced inspection
Methods	Statistical tools and techniques
Role of quality professionals	Troubleshooting, application of statistical methods
Responsible for quality	Manufacturing and engineering departments

3. Quality assurance and quality management systems

- Narrow, manufacturing based –> broader implications for management
- Costs of quality: avoidable – unavoidable
- Total quality control: cooperation of multiple departments
- For manufacturing control:
  - ✓ not only statistical methods and traditional techniques,
  - ✓ but new product development,
  - ✓ vendor selection,
  - ✓ customer service.

3. Quality assurance and quality management systems

- Reliability engineering: need of greater attention with the growth of aerospace and electronics industries
- Zero defects: three main causes of worker errors (lack of knowledge, lack of proper facilities, lack of attention)
- Organization efforts on planning and preventing problems from occuring at source
- Information back to those involved in the process
- The emphasis is on the design and manufacturing

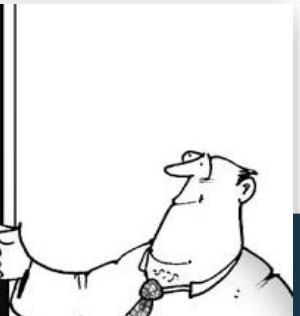
3. Quality assurance and Quality Management Systems

Feature	Quality management systems
Primary concern	Coordination
View of quality	A problem to be solved but one that is attacked proactively
Emphasis	The entire production chain, from design to market, and the contribution of all functional groups, especially designers, to prevent quality failures
Methods	Programs and systems
Role of quality professionals	Planning, program designing
Responsible for quality	All departments, top management is only peripherally involved in designing, planning and executing quality policies

The ”quality of management” is as important as the ”management of quality”.

4. Total Quality Management

- Managers's interest in quality: profitability link, customers' point of view, inclusion in the strategy
- Influences: increased foreign competition, jump in liability from the government
- New approach to quality by the upper management
- Discovered connection between quality and productivity
- New key responsibilities: education and training



4. Total Quality Management

Feature	Total quality management
Primary concern	Strategic impact
View of quality	A competitive opportunity
Emphasis	Market and consumer needs
Methods	Strategic planning, goal setting, mobilizing the organization
Role of quality professionals	Education and trainings, goal setting, consultative work with other departments, program design
Responsible for quality	Everyone in the organization with top management exercising strong leadership

4. TQM key elements

- Commitment and leadership of CEO: nothing happens without the CEO
- Planning and organization: clear, long-term strategy; all levels
- Using tools and techniques: supporting and developing continuous improvement
- Education and training: general awareness, understanding QM concepts, skill, competences, attitudes, common language, formal education and training program

4. TQM key elements

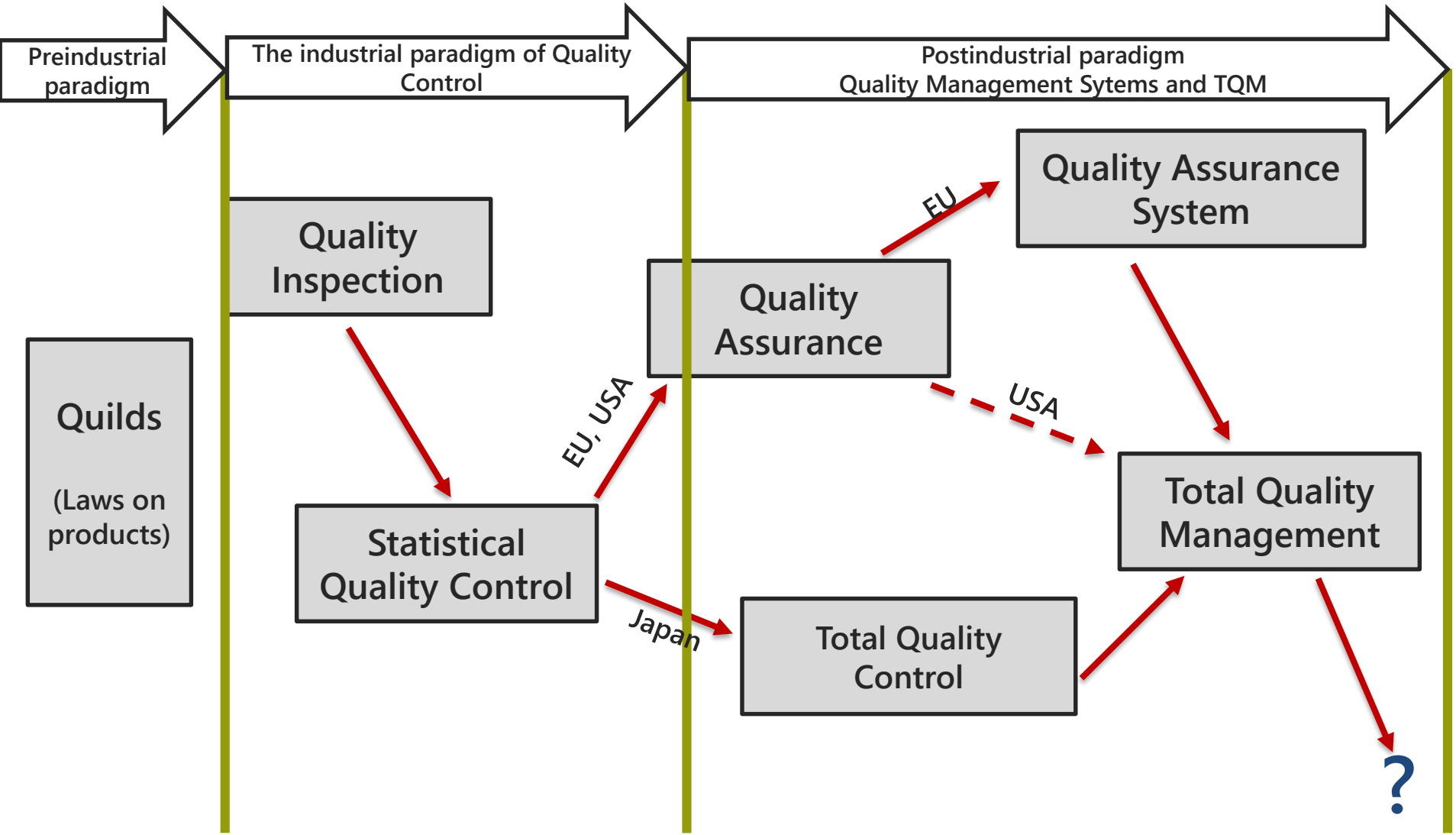
- Involvement: broad employee interest, participation, contribution in the improvement
- Teamwork: commitment and participation of people, recognition of positive performance
- Measurement and feedback: need to be used continually
- Ensuring that culture is conductive to continuous improvement activity

TQM's quality definition

Quality is an ultimate business strategy. It ensures that the totality of features and characteristics of a product or service bear upon its ability to satisfy stated or implied customer needs which represent a moving target in a

QUALITY = CONFORMANCE TO CUSTOMERS' CHANGING NEEDS AND REQUIREMENTS

The improvement of quality management



Quality Schools

Features	Japanese	American	European
Spread	Multitudinous, bottom-up	Top-down, snowball principle	Production and technology management
Carrier layer	Quality circles	Top management	Middle management
Specialities	Totality, basic, simple tools and techniques	Management environment, different focus	Standardization, regulation
Key elements	Quality circles	Management climate	Documented monitoring, shadowing
Domestic gap	Motivational	Management	Quality, culture and IT

What do you mean by the quality of a university course /lecture?

- The voice of the customer

kahoot.it

Thank you for your kind attention!

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