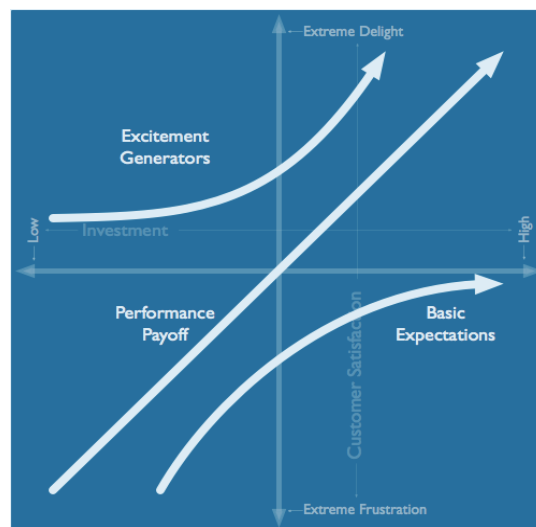
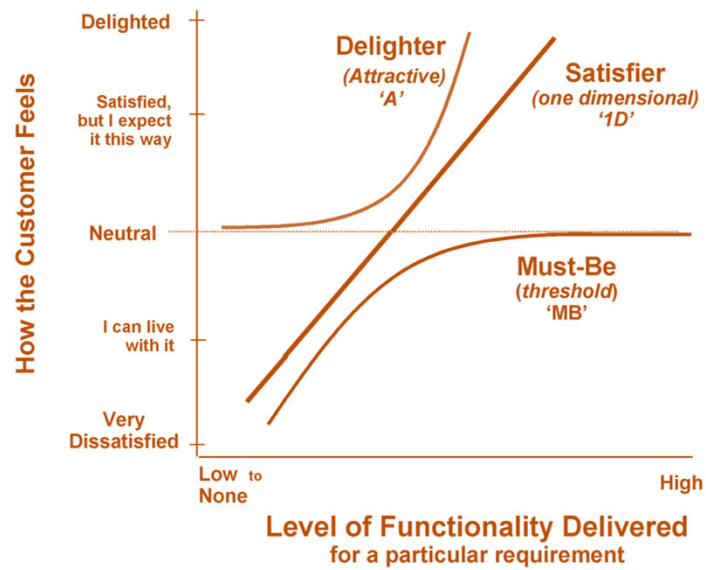


Kano's Quality Model



狩野紀昭



A Note on the Manufacturing Background of Traditional Training for Quality

“Gurus” in quality management and quality engineering textbooks, such as

- Shewhart
- Juran
- Deming
- Crosby
- Ishikawa
- Taguchi
- Feigenbaum

are essentially from the era of mass manufacturing of **goods**

Orthodox formal training and education:
conformance and a *defensive* orientation

As a result of mass manufacturing:

- ✓ Standardization
- ✓ Specifications
- ✓ Testing and inspection
- ✓ Acceptance sampling plans
- ✓ Process capability analysis
- ✓ Process control
- ✓ Certification (e.g. ISO)

Focused on
the *tangible* and the *immediate*

- ✓ Fitness for use
- ✓ Customer satisfaction
- ✓ “Right the first time”
- ✓ “Parts per million” or yield
- ✓ Cost of quality
- ✓ Sigma level; “dpmo”
- ✓ “ZD”

Smartphone Platform Roadmap

PERFORMANCE SMARTPHONE
Intel Atom™ Z2460
Up to 2.0 GHz Processor
Intel XMM™ 6260 HSPA+

Higher Performance

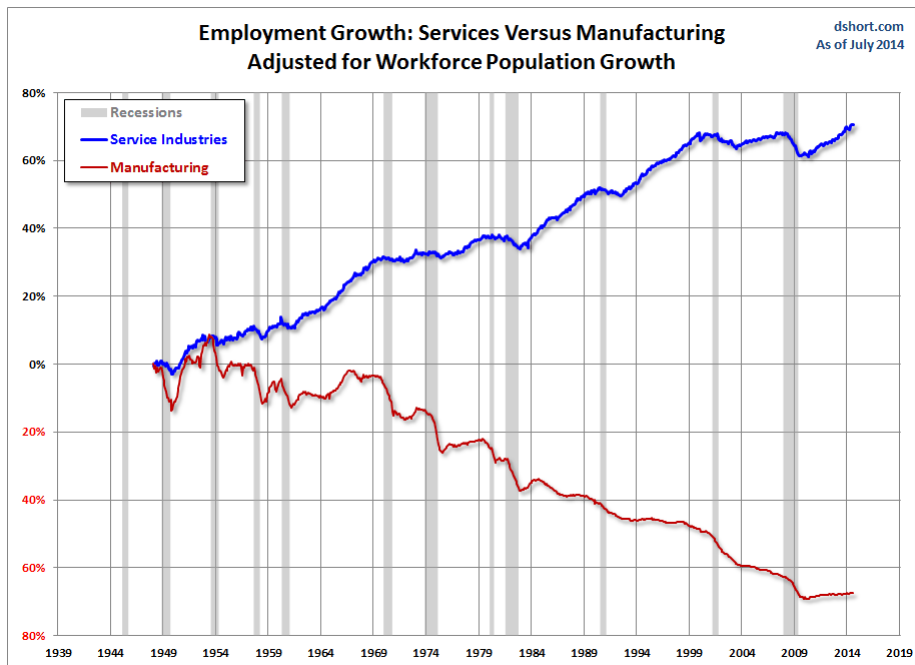
Intel Atom™ Z2580
2x Performance
Intel XMM 7160 LTE & 2x HSPA+

Sources / Loads:
Electric motors,
solar panels, etc.

Power electronics:
inverter, etc.

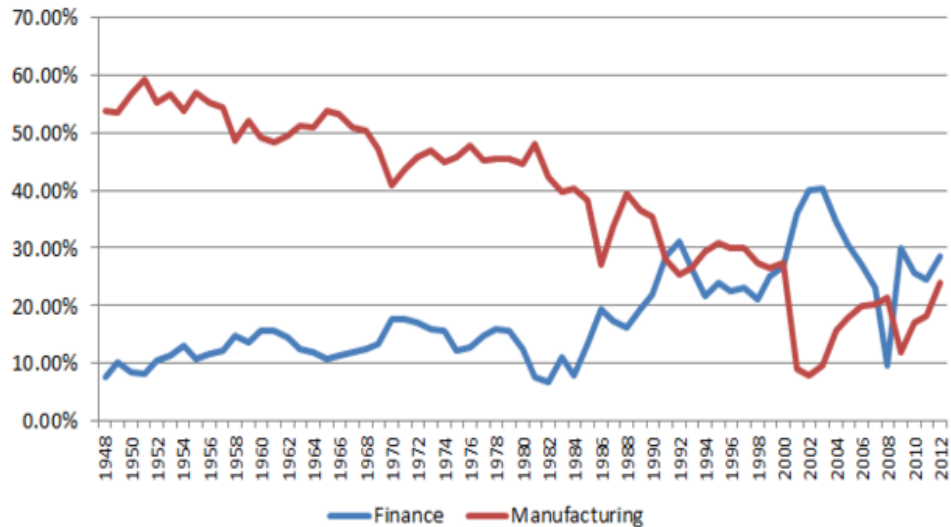
HARDWARE ALONE IS NOT THE FUTURE

Design
Circuit
Power



Finance and Manufacturing Share of All Domestic Corporate Profits

BEA, NIPA Table 6.16, Annual Data. 2012 is based on annualized Q3 data. "Finance" totals are based on "other financial," which excludes Federal Reserve banks.



The traditional and the new

- The traditional approach to product development focuses on the value of the tangible product *at the time it is delivered* to the customer
- The locus where truly innovative, competitive, high-tech products are developed today is at the nexus of hardware, software, and services
- At its best, embedded and application software provides a stream of services *throughout the life cycle* of manufactured products

Service Quality

What is behind Service Quality?

Quality in Services

- *Service* is defined as “any primary or complementary activity that does not directly produce a physical product – that is, the non-goods part of the transaction between buyer (customer) and seller (provider).”

Some features of Service Quality studies

1. The process can be, and often is, more relevant or felt more important than the product
2. A defect or defective is often more noticed (and seems more critical) than a “good” outcome
3. Level of quality tends to be measured and compared via a negative scale (e.g. *dpmo* instead of yield; complaints about service received tend to be more attention-catching than compliments)
4. What constitutes a defect or defective could be very subjective

Some features of Service Quality studies

5. An instance of service tends to have to be highly customized (vs. standardization or mass production in manufacturing)
6. Specification limits or tolerances not only tend to be subjective or impossible, it could also be location-dependent and time-varying
7. Standardization, calibration and benchmarking could be inadequate, difficult, or impossible
8. Delays are common in the recognition of defects or defectives

Some features of Service Quality studies

- 9. Service quality relates much more with information flow and utilization than what many traditional quality practitioners are used to
- 10. Available information tends to be qualitative (i.e. discrete or attribute data) rather than quantitative (i.e. continuous or measured data)
- 11. Service systems do not lend themselves readily to data-intensive methodologies such as Six Sigma
- 12. System boundary could be difficult to draw in a study; noise is usually large and, by definition, not controllable

Some features of Service Quality studies

- 13. The role of raw material is usually low
- 14. Inventorization, i.e. accumulation of services, is normally not possible
- 15. Customers themselves could be voluntarily or involuntarily involved in the way service is generated
- 16. Cultural factors, values and ethics could be involved in judgments

Critical Differences Between Service and Manufacturing (1 of 2)

- Customer needs and performance standards are more difficult to identify and measure
- Services requires a higher degree of customization
- Output is often intangible

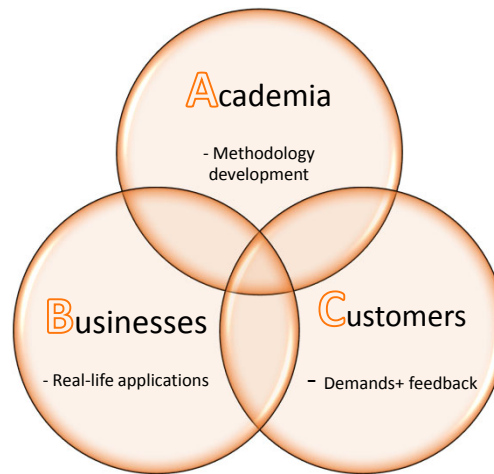
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Critical Differences Between Service and Manufacturing (2 of 2)

- Services are produced and consumed simultaneously
- Customers are often involved in actual process
- Services are more labor-intensive than manufacturing
- Services handle large numbers of transactions

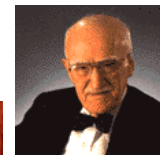
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Summary: **ABC** OF QUALITY IMPROVEMENT



Leaders in the Quality Revolution

- W. Edwards Deming
- Joseph M. Juran
- Philip B. Crosby
- Armand V. Feigenbaum
- Kaoru Ishikawa



Deming Philosophy

- The Deming philosophy focuses on continual improvements in product and service quality by reducing uncertainty and variability in design, manufacturing, and service processes, driven by the leadership of top management.

2
1

The Wisdom of Deming

The Wisdom of W. Edwards Deming

- When a system is stable, telling the worker about mistakes is only tampering
- Whenever there is fear, you will get wrong figures
- You cannot define being exactly on time
- You should not ask questions without knowledge
- All anyone asks for is a chance to work with pride
- Any manager can do well in an expanding market
- Eliminate numerical quotas, including Management by Objectives

The Wisdom of W. Edwards Deming

- Hold everybody accountable? Ridiculous!
- If you can't describe what you are doing as a process, you don't know what you're doing
- If you do not know how to ask the right question, you discover nothing
- Innovation comes from the producer – not from the customer
- It is not enough to do your best; you must know what to do, and then do your best
- It is not necessary to change. Survival is not mandatory
- Profit in business comes from repeat customers, customers that boast about your project or service, and that bring friends with them

The Wisdom of W. Edwards Deming

- Quality is everyone's responsibility
- Rational behavior requires theory. Reactive behavior requires only reflex action
- The average American worker has fifty interruptions a day, of which seventy percent have nothing to do with work.
- The emphasis should be on why we do a job
- The result of long-term relationships is better and better quality, and lower and lower costs
- We are here to make another world

FIVE DEADLY DISEASES OF MANAGEMENT – W. EDWARDS DEMING

1. Lack of constancy of purpose
 - No planning for the future
 - Lack of long-term definition of goals
2. Emphasis on short term profits
 - Worship of the quarterly dividend
 - Sacrificing long-term growth of the company
3. Annual grading of performance
 - Arbitrary and unjust system
 - Demoralizing to employees
 - Nourishes short-term performance
 - Annihilates team work, encourages fear

FIVE DEADLY DESEASES OF MANAGEMENT – W. EDWARDS DEMING

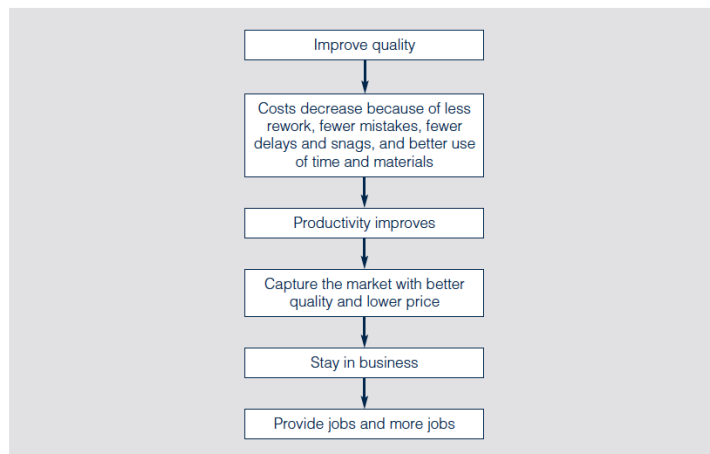
4. Mobility of Management

- No roots in the company
- No knowledge of the company
- No understanding of its problems

5. Use of visible figures only

- No use of figures that are unknown and unknowable
- Encouraged by business schools

FIGURE 2.1
The Deming Chain
Reaction



Source: Based on Deming, W. Edwards, Out of the Crisis, figures: Fourteen Points, condensed and expanded versions, pages 23–24, © 2000 Massachusetts Institute of Technology.

Deming's 14 Points (Abridged) *(1 of 2)*

1. Create and publish a company mission statement and commit to it.
2. Learn the new philosophy.
3. Understand the purpose of inspection.
4. End business practices driven by price alone.
5. Constantly improve system of production and service.
6. Institute training.
7. Teach and institute leadership.
8. Drive out fear and create trust.

2
9

Deming's 14 Points *(2 of 2)*

9. Optimize team and individual efforts.
10. Eliminate exhortations for work force.
11. Eliminate numerical quotas and M.B.O.
Focus on improvement.
12. Remove barriers that rob people of pride of workmanship.
13. Encourage education and self-improvement.
14. Take action to accomplish the transformation.

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WITH AIM TO FOSTER UNDERSTANDING OF
THE DEMING SYSTEM OF PROFOUND KNOWLEDGE™

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