Quality Engineering and Management

Lecture Ib

Background and History of Quality

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Movers and Shakers of Quality Management Over the Years

Walter Shewhart (1920's)

Published statistical analysis methods in the control of quality

"Statistical Method from the Viewpoint of Quality Control" (1939)

Movers and Shakers of Quality

Walter Shewhart (1920's)

Developed "scientific sampling" in Quality Control

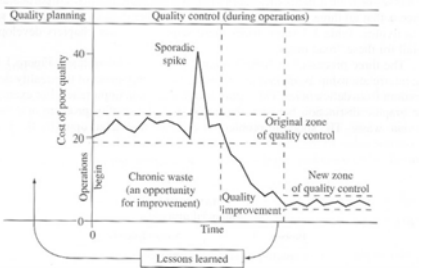
Movers and Shakers of Quality

Joseph Juran
(Original first author of our text)

Juran Trilogy

- *quality planning*
- *quality control*
- *quality improvement*

Juran Trilogy diagram (Juran, 1986)



Movers and Shakers of Quality

Edward Deming (1950's)

Lectured Japanese scientists and engineers (1950)

Four parts of his systematic approach

- *systems approach*
- *understanding statistical variation*
- *nature and scope of knowledge*
- *psychology of human behavior*

Movers and Shakers of Quality

Edward Deming

You can not "inspect" quality into a product"

Movers and Shakers of Quality

Edward Deming

***Common causes** are due to the" system" and can be corrected only by management. They typically account for about 85% of quality problems. The "system" includes all general aspects of the business such as product engineer-ing, manufacturing / assembly, purchasing, marketing, etc.*

Movers and Shakers of Quality

Edward Deming

***Special causes** relate to an individual process itself and can be resolved by the local people involved (e.g., operators, supervisors, maintenance people, etc.) . Special causes typically account for about 15% of problems.*

Movers and Shakers of Quality

Edward Deming's 14 Points

1. *Innovate and allocate resources to fulfill the long-range needs of the company and customer rather than short-term profitability.*
2. *Discard the old philosophy of accepting defective products.*
3. *Eliminate dependence on mass inspection for quality control; instead, depend on process control, through statistical techniques.*

Movers and Shakers of Quality

Edward Deming's 14 Points

4. *Reduce the number of multiple source suppliers. Price has no meaning without an integral consideration for quality. Encourage suppliers to use statistical process control.*
5. *Use statistical techniques to identify the two sources of waste-system (85%) and local faults (15%); strive to constantly reduce this waste.*
6. *Institute more thorough, better job-related training.*

Movers and Shakers of Quality

Edward Deming's 14 Points

7. *Provide supervision with knowledge of statistical methods; encourage use of these methods to identify which defects should be investigated for solution.*
8. *Reduce fear throughout the organization by encouraging open, two-way, non-punitive communication. The economic loss resulting from fear to ask questions or report trouble is appalling.*
9. *Help reduce waste by encouraging design, research and sales people to learn more about the problems of production.*

Movers and Shakers of Quality

Edward Deming's 14 Points

10. *Eliminate the use of goals and slogans to encourage productivity, unless training and management support is also provided.*

11. *Closely examine the impact of work standards. Do they consider quality or help anyone do a better job? They often act as an impediment to productivity improvement.*

12. *Institute rudimentary statistical training on a broad scale.*

Movers and Shakers of Quality

Edward Deming's 14 Points

13. *Institute a vigorous program for retraining people in new skills, to keep up with changes in materials, methods, product designs, and machinery.*

14. *Make maximum use of statistical knowledge and talent in your Company.*

Movers and Shakers of Quality

Philip Crosby

Book titled "Quality is free"

Concept of "zero defects"

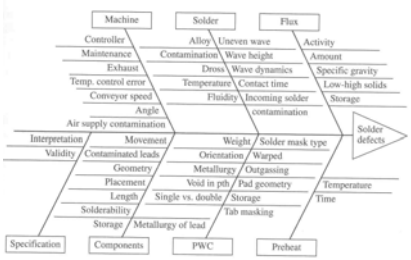
Movers and Shakers of Quality

Kaoru Ishikawa

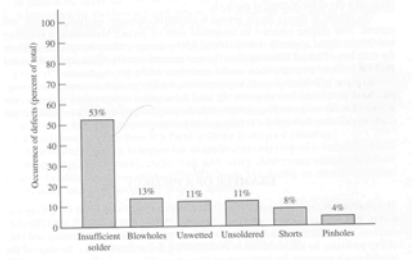
Quantitative and graphical methods of problem analysis and solution

- *Cause and effect diagram*
- *Pareto chart*

Cause-Effect Diagram (Kaoru Ishikawa)



Pareto Analysis/ Diagram (Kaoru Ishikawa)



Movers and Shakers of Quality

Genichi Taguchi

Understanding

"variation"

is important in production systems

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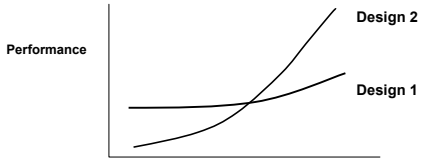
Genichi Taguchi

"Robust" product and process designs



Movers and Shakers of Quality

Genichi Taguchi

"Re – introduced" statistical methods that had existed for many years in the U.S., but had not been used by industry.

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Many more have participated in the "quality revolution" That has occurred over the years.