Modern Quality Innovators and the Origin of TQM

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U.S Quality Innovators

Dr. Walter A. Shewhart (1891-1967)

- Worked at Western Electric and Bell Telephone Laboratories as a statistician
- Pioneer of modern quality control, began to focus on controlling processes. Explained process variability.
- Developed control chart theory/ recognized variation-common cause and special cause. Began to analyze data yielded from processes.
- Developed plan-do-check-act (PDCA) cycle. Used statistical techniques to determine whether a process is in control and stable. Control Chart has revolutionized the management of process.

Dr. W. Edwards Deming (1900-1993)

- Studied under Shewhart at Western Electric and Bell Laboratories (Internship program)
- Involved, in 1947, in the early planning for the 1951 Japanese Census
- In 1947, Rice Statistics Mission Member
- In 1950, assistant to the supreme commander of the Allied Powers
- Worked as instructor in sample survey methods in government statistics
- Widely known for helping CEO's of Japanese Companies apply Shewhart's SPC
- Considered as a founder of Japanese third wave of industrial revolution.
- Widely used PDCA as a systematic approach to problem solving and continual improvement
- Believed that 85% of worker's effectiveness depends upon environment, nominally, depends upon his skills

Seven deadly diseases/Sins of Western Managers

- Lack of constancy of purpose/ Lack of long term strategy
- Emphasis on short-term profits
- Too much emphasis on performance appraisals
- Mobility of management (Job-hopping)
- Running a company on visible figure alone, neglect of other not visible aspect of Org.
- Excessive medical costs
- Excessive costs of warranty, fueled by lawyers who work for contingency fees

Deming's Key Principles of management (14 Points)

- Create constancy of purpose toward improvement of product and service
- Adopt new learning philosophy (no acceptance of delay, mistakes and defective workmanship)
- Cease dependence on inspection – build quality into products in the first place
- Drive out fear and build employee trust.
- End low cost bidding – seek long-term supplier relationship
- Eliminate numerical goals; abolish annual rating or merit system
- Eliminate slogans, extortions and targets for workforce
- Teach and institute leadership to improve all functions
- Institute modern methods of training on-the-Job
- Educate with self-improvement programs etc.
- Breakdown the barriers between departments
- Take actions to accomplish transformation
- Improve the System of Production and Services
- Everybody has to accomplish the Transformation

The Deming system of profound knowledge
(Knowledge for Leadership of Transformation)

- Appreciation of a system (producers, suppliers, and customers)
- Knowledge of variation –range and causes of variation
- Theory of Knowledge – (There is no substitute for knowledge – a small amount of knowledge could save many hours of hard work)
- Knowledge of Psychology-concept of human nature

The Deming Chain Reaction

Quality Improvement

Costs Reduction

Productivity Improvement

Greater market share

Sustainability in business

Providing Jobs and more Jobs

Deming Contd.

- Best known for NBC news white paper "If Japan can why can't we" broadcast 1980, described how Japan captured the auto, shipbuilding and electronics markets by practicing continual improvement and thinking of manufacturing as a whole.
- Regarded as the Father of Modern Quality
- The key to quality: reducing variation

Deming (Later years in America):

We have learned to live in a world of mistakes and defective products as if they were necessary to life. It is time to adopt a new philosophy in America.

Joseph M Juran (1904- 2008)

- Worked at Western Electric's Hawthorne plant.
- Studied with Shewhart
- Invited to Japan in1952
- Developed Quality Trilogy - quality Planning, quality control and quality Improvement (Different aspects of good quality management)
- First quality guru, who introduced the Interval Customer Concept.
- Developed a concept of vital few, trivial many (foundation of Pareto Charts)
- Founding member of American Society for Quality.

Juran's 10 steps to quality improvement

1) Build awareness of the need and opportunity for improvement
2) Set goals for improvements
3) Organize to reach the goals
4) Provide training
5) Carry out projects to solve problems
6) Report progress
7) Give recognition
8) Communicate results
9) Keep score of improvements achievement
10) Maintain momentum

Dr. Philip Bayard Crosby (1926-2001)

- Having worked for several aerospace firms he joined at ITT (International Telephone and Telegraph) in 1965.
- Developed a concept of zero defects (Z D) /get it right the first time. He argued- 'doing it right the first time is less expensive than the costs of detecting and correcting non- conformance.
- He is best known for zero defects methodology, which emphasizes employees, responsibility, exhortations and slogan not technical aspect of process

Croby's Absolutes of quality (Ideas/ Principles):

- Quality is defined by conformance to requirement, not goodness; non-quality is non-conformance).
- System for causing quality is prevention not appraisal
- Performance standard must be zero defects not 'that's close enough'
- Measurement of quality is the price of non-conformance, not indexes.
- There is no such thing as quality problem (Added, later on)

Crosby's fourteen steps of quality improvement

1) Management Commitment
2) Quality improvement teams
3) Quality Measurement teams
4) Cost of Quality Evaluation
5) Quality awareness
6) Corrective action
7) Zero defects planning
8) Supervisory training
9) Hold Zero Defects Day
10) Goal Setting
11) Error cause removal
12) Recognition
13) Quality councils
14) Do it all over again

Dr. Armand V Feigenbaum (1920-)

* Served at General Electric during WW 2 (Engineer)
* Founding chairman of the International Academy for Quality
* Past president of the American Society for Quality Control
* Developed an approach to Total Quality Control (productivity/market Penetration/competitive advantages)

(The above phrase Total Quality Control was used in his book Quality Control: Principle, Practice and Administration 1951)

Types of quality control

1) New design control (Process/ Product)
2) Incoming materials control (Existing Standards)
3) Product control (Acceptance Sampling)
4) Process control (Adjusting Process Variation)

Steps of quality control

1) Setting quality standards
2) Appraising conformance to these standards
3) Acting when standards are met or exceeded

Quality Principles:

- Management Involvement
- Employee Involvement
- First line supervision leadership, company-wide quality control
- Defined quality as the best for the customer used at the right selling price (value based approach)
- Viewed Quality Control not merely as a technical issue but more importantly as a business method

Armand Contd…

Best known for quantifying Costs of quality

- **Prevention cost (Preventing defects and faulty products/services)**
- **Appraisal (Inspection)**
- **Failure**
  1) **Internal-scrap, rework**
  2) **External-warranty, complaints**
- **He is known for 'hidden factory'-'quality is what the customer says it is'**
- **Widely recognized as the father of Total Quality Management (Jim L. Smith, director, American Society for Quality)**
- **Received the National Medal of Technology and Innovation from president George W. Bush in September 29,2008, the highest honor for technological achievement**

Feigenbaum's definition of Total quality control:

'Total quality control is an effective system for integrating the quality development, quality maintenance and improvement efforts of the various groups in an organization so as to enable production and service at the most economical levels which allow for full customer satisfaction.'

Japanese Quality Innovators

Dr. Kaoru IShikawa (1915-1989)

- Studied Under Deming, Juran and Feigenbaum
- Served as a professor of engineering at the University of Tokyo
- Actively participated in quality movement in Japan.
- Served as a member of JUSE
- Developed Japanese Total Quality Control (Company -Wide Quality Control - 1955-60)
  a) Quality first – not short term profit
  b) Next process is your customer
  c) Use of facts and data
  d) Respect for Humanity as a management philosophy – full Participation
  e) Cross-functional management
- Pioneer of Quality Control Circle movement

What for quality circles

- To support improvement
- To maintain human relation in the workplace
- To increase job satisfaction
- To recognize employee capabilities and making use of ideas

- Developed cause and effect diagram (fishbone diagram)
- Advocated other improvement tools such as Pareto charts, Scatter diagram, Process flow chart, Check Sheets, Histograms and Control Charts

Genichi Taguchi (1924-)

Developed

- Quality loss function- deviation from target is a loss to society
- Application of design of experiments/ Robust Engineering (Product development)
- Online in Production and offline in design
- Offline quality control
  - System design (creation of design)
  - Parameter design (design features tested/ determined)
  - Tolerance design (Tightening tolerance of factors that have large Impact on variation)

Shigeo Shingo (1919-1990)

- Contributed as the world's leading expert on manufacturing process.
- Quality control at the source rather than through quality inspection
- Developed Poka-Yoke system (Mistake proofing device, sensors/ monitors)
- Zero defects approach -ultimate goal.
- Developed Just-in-time manufacturing system (Along with Taiichi Ohno created many features of Jus-in-time-JIT)
- Inventor of SMED (single minute exchange of die) as a system of quick change overs between products for reducing changeover times
- He emphasized production rather than organizational issues.

(Zero quality control is ideal production system.)

Basic Concepts of Quality

Managerial Perspective

1) Product- based approach (Quality of ingredients, grading and capability of Products-craftmanship)
2) Manufacturing – based approach (Design or specification)
3) Value- based approach (affordable excellence/ price and quality)
4) User – based approach (level of satisfaction)

Critical Perspective:

- Transcendental Approach (Innate excellence, quality is neither mind nor matter but a third entity independent of these two-emotions, feelings, presser, pain, hate, happiness)
- Social Constructivist Approach (social nature/ collective view/certification body)
- Discursive Approach (language, power, reality, social convention/power relations/discourses)
- Slogan Approach (may pursue various ends)

TQM Known as :

- Customer driven Philosophy
- Very demanding mgmt regime
- Paradigm shift in mgmt
- Holistic mgmt approach
- Mgmt revolution
- Quality revolution
- Different away of approaching work
- Universal phenomenon
- Rapid area of growth in govt.

Simple objective and scope of TQM

- Do the right things, **right**

  first time, and every time".
- Scope of TQM**:** The application of TQM is not limited

Evolution of TQM (The Quality Hierarchy)

Reactive

Inspection	Detention
	Finding and locating error
Quality control (QC)	Detention
	Finding and locating error
Quality Assurance (QA)	**Proactive**
	Prevention
	Stop Problem at source
	Design Emphasis

Evolution of TQM (The Quality Hierarchy) Contd……

Proactive

TQM	Prevention
	Stop Problem at source
	Design Emphasis

Origin of TQM

Different Views

- Why TQM is capitalized? Proper noun? Who developed it? How much it costs?
- It's been around in Japan since the 1950's and it has been in use in the U.S. since the 1980's.
- TQM was popular from about 1985 to 1995.
- Deming in conjunction with Joseph M Juran, Philip Crosby and Kaoru Ishikawa laid foundation of TQM.
- Deming was the founding father of TQM.
- But Deming strongly reacted in a negative manner when anyone attempted to link him with TQM. Deming did not like the term. He said,
- **'The term is counter productive. My work is about a transformation in management and about the profound knowledge needed for the transformation. Total quality stops people from thinking (Singe, 1992)**

Origin of TQM Contd……

- TQM was actually coined by the US navy officer in the early 1980's. TQM also owes its origin to Dr Armand Feigenbaum and his book Total Quality Control
- Armond V Feigenbaum is widely recognized as the father of Total Quality Management.
- D. Wilson (Open University) –TQM as a slogan has been around since 1985.
- **Martin Murray**: By the 1970's the notion of total quality was being discussed. This was seen as company-wide quality control that involves all employees from top mgmt to the workers, in quality control. In the next decade more **non-Japanese Companies** were introducing quality management procedures that based on the results seen in Japan. **The new wave of quality control became known as TQM,** which focused strategies and techniques that became the center of focus for the **quality movement**.

Origin of TQM Contd……

- The 'home court advantage'
- Don't forget that TQM started in USA, Not Japan. TQM's home court is America.
- Being an engineering term TQM is completely different from quality management; it's ridiculous that someone would suggest merging them. Don't agree with combining them. Quality management is the broad, generic term. TQM is specific technique for quality management. There are plenty of other techniques, and to suggest they are synonymous is incorrect. They aren't.
- In the 1980's to 1990's, a new phase of quality control and management began. This became known as TQM.
- Bill Creech, retired General, US Air Force (Tactical Air Command) claimed to have coined the term 'Total Quality Management' in early 1980's, (The Five Pillars of TQM, p6,7-1995). Bill devised the term from a total approach to put quality in every aspect of management.

Five Pillars of TQM (Bill Chreech):

- Product
- Process
- Organization
- Leadership
- Commitment.

QALTY needs U and I

Thank you