Quality Thinking – A Way of Life

64th Inaugural Professorial Lecture

21 January 2015

Dewan Jumaah

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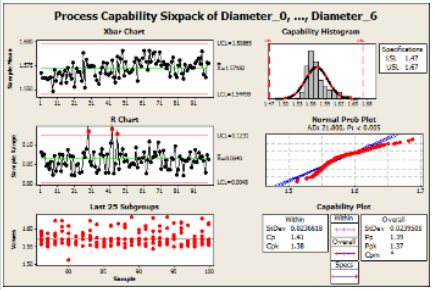
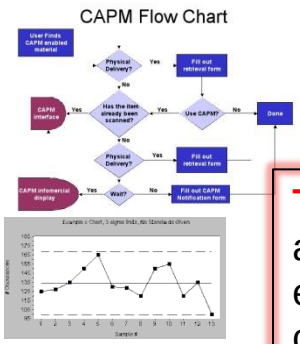
Quality Engineering and Quality Management

Definitions in Quality

Statistical process control (or SPC) is a method of understanding how well a process is performing within a set of criteria.

- **Seven Tools of Quality**

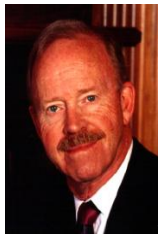




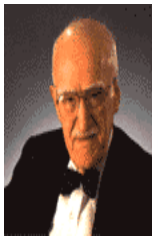
W. EDWARDS DEMING

Kaoru Ishikawa

TQM- A management philosophy embracing all activities through which the needs and expectations of the customer and the community, and the objectives of the organization are satisfied in the **most efficient and cost effective** way by maximizing the potential of all employees in a continuing drive for improvement. - BS4778

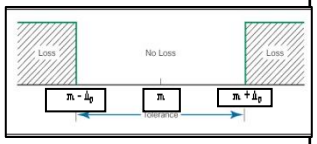
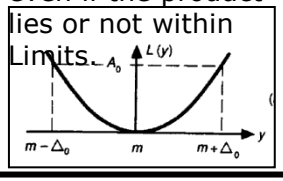


Phillip Crosby



J.M. Juran

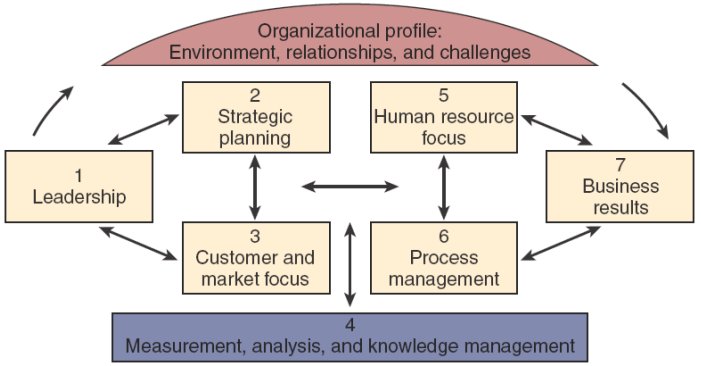
Traditional and Taguchi's Defination of Quality

Traditional	Taguchi's
There is Good or Bad Products only as per Limits. 	When a product moves from its target will cause the loss even if the product lies or not within Limits. 

Factor	Level 1	Level 2
A – Mould Temp	A1 = 500 ^{0} C	A2 = 600 ^{0} C
B – Melt temp	B1 = 1350 ^{0} C	B2 = 1450 ^{0} C
C - Additive	C1 = No additive	C2 = Additive Present

FMEA
QFD
DFSS

Deming 14 Points
SERVQUAL
Quality Award
ISO 9000 Quality Mgt System
Customer Satisfaction Models
CSFs in TQM
Six Sigma



Source: Images from internet

The Journey to Excellence and Quality Thinking

- Defining Quality
- Total Quality Thinking
- Research in UTM on TQM, Business Excellence, Lean
- Future research directions
- Some thoughts and closing remarks

Beginning (Muqaddimah)

- ‘life behind the quality dikes’ (Juran, 1995) – we are all dependent upon quality of products and services in our daily living and as well as technology – smartphones, internet services, transportation system, banking, healthcare


worldatlas
Borkum
East Frisian Islands
West Frisian Islands
Schiermonnikoog
Ameland
Terschelling
Vlieland
Nes
Waddenzee
Germany
Delfzijl
Leeuwarden
Groningen
North Sea
Texel
Afsluidtijk Dike
Harlingen
Netherlands
Bolsward
Sneek
Assen
Ems River
Den Helder
Heerenveen
IJsselmeer
Emmen
Emmeloord
Hoogeveen
Hoorn
Urk
Houtribdijk Dike
Meppel
Alkmaar
Markermeer
North Sea Canal
Volendam
Zwolle
Germany
Zaanse Schans
Lelystad
Haarlem
Realte
Almelo
Amsterdam
Ermelo
IJssel River
Vechte River
Aalsmeer
Hilversum
Enschede
The Hague
Leiden
Deventer
Apeldoorn
Gouda
Utrecht
Neder Rijn
Arnhem
Europoort
Delft
Doetinchem
Haringvliet
Rotterdam
Lek River
Waal River
30 mi
30 km
Maas River
Oss
Oosterschelde
Hertogenbosch
Mark
Breda
Maas River
Rossendaal
Middelburg
Tilburg
Helmond
Westerschelde
Eindhoven
Terneuzen
Bergen op Zoom
Venlo
Rhine River
Germany
Antwerp
Weert
Belgium
Meuse River
Schelde River
Heerlen
Brussels
Maastricht
Vaalserberg
NETHERLANDS
BELOW SEA LEVEL
LOW HILLS
CANAL
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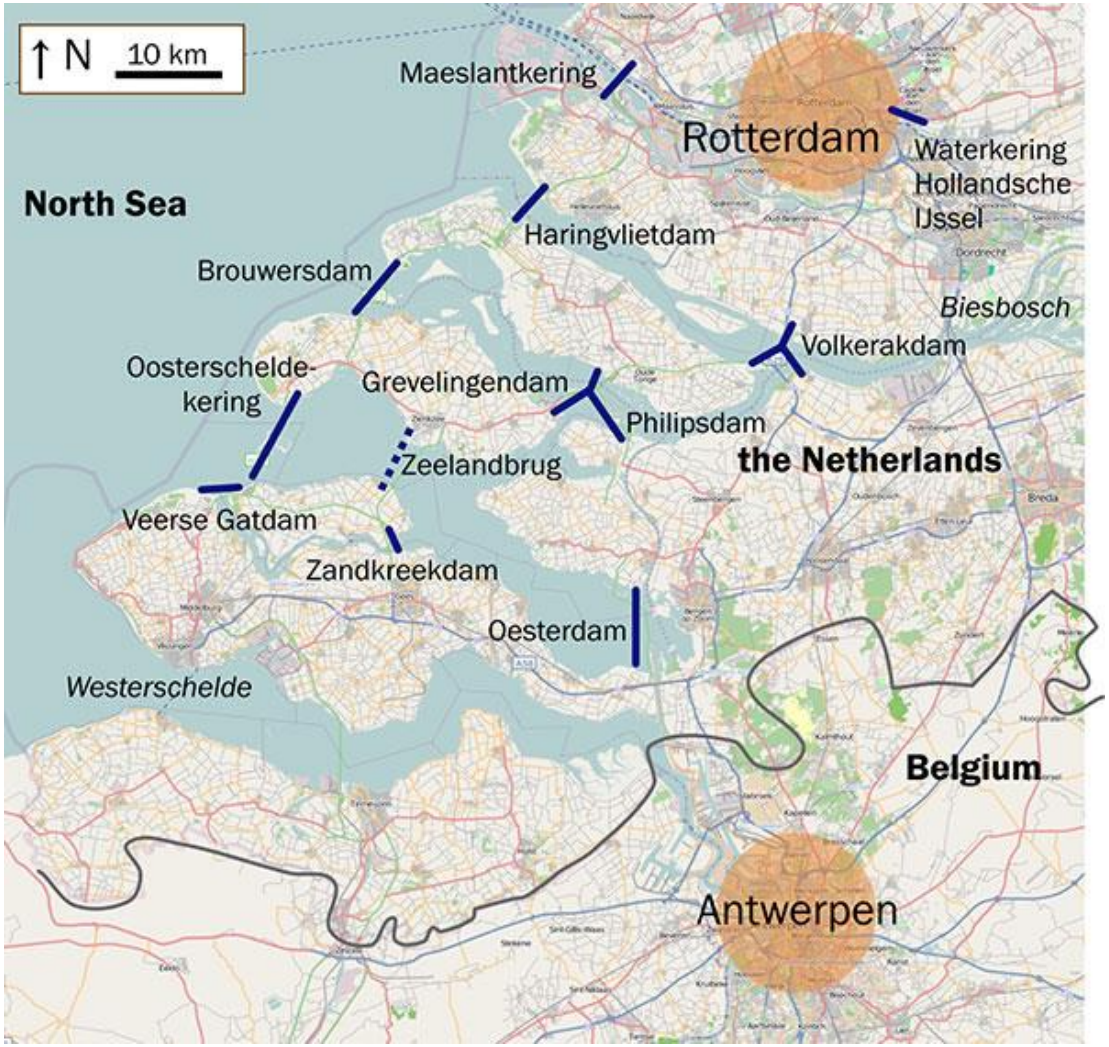
The Netherlands:
if there were no dikes...
Germany
Belgium

Dams built to protect lives



Defining Quality

What is Quality?

- Fit for purpose or use (Juran)
- “The totality of features and characteristics of a product or service that bear on its ability to satisfy stated and or implied needs” (ANSI/ISO)
- Conform to specification (Crosby)
- Performance beyond expectations
- Taguchi’s view, quality is not defined by specific limits, but rather on whether or not it creates a financial loss to society
- Quality is only useful and of value when it means the same thing to all the people in an organization

Quality perspectives

1. Transcendental view

- Quality is something we can recognize but cannot define
- Superior , “goodness of a product.”

2. User view

- Quality is fitness for use
- Products meeting different needs and wants, and hence different quality standards.

3. Manufacturing view

- Quality is conformance to specification
- “the desirable outcome of a engineering and manufacturing practice, or conformance to specification.”
- Engineering specifications are the key!

Quality perspectives

4. Product view

- Quality is tied to inherent product characteristics
- “function of a specific, measurable variable and that differences in quality reflect differences in quantity of some product attributes.”

5. Value-based view

- Quality depends on the amount the customer is willing to pay
- “quality product is the one that is as useful as competing products and is sold at a lesser price.”

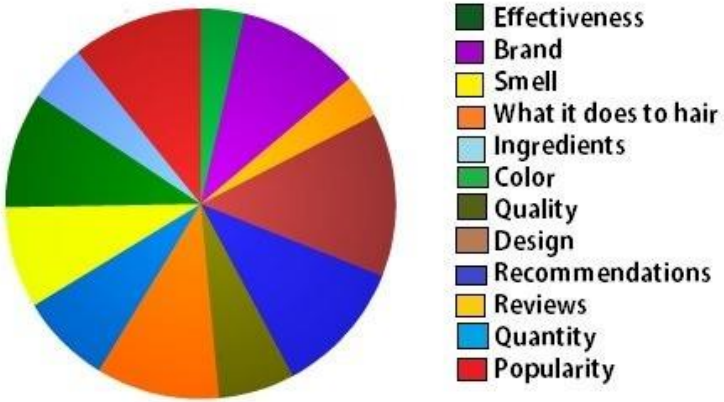
Quality Dimensions (Garvin, 1998)

Dimension	Meaning
Performance	Primary product characteristics
Features	Secondary characteristics added features
Conformance	Meet specifications or industry standards, workmanship
Reliability	Consistency of performance overtime
Durability	Useful life
Service	Resolution of problems and complaints, ease of repair
Response	Human-to-human interface
Aesthetics	Sensory characteristics
Reputation	Past performance, ranking first

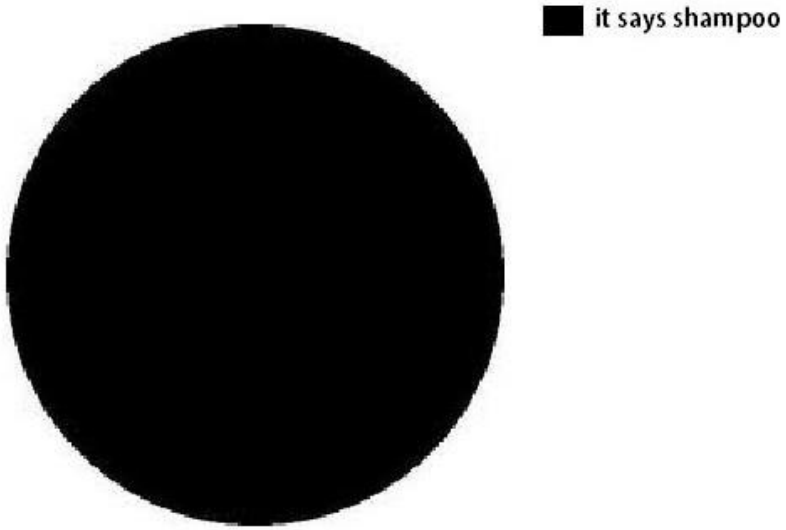
- **Quality dimensions are independent**
- **focus on a few dimensions (e.g. Japanese cars – reliability, conformance, and aesthetics)**

What features customers look for in a shampoo?

HOW WOMEN CHOOSE SHAMPOO:



HOW MEN CHOOSE SHAMPOO:



Quality History and Evolution

- Medieval Europe - craftsmen in guilds late 13th century
- Early 19th century, manufacturing follow this craftsmanship model
- Industrial Revolution in Great Britain 1750s created Factory system with emphasis on product inspection
- Early 20th century manufacturers began to include quality processes in quality practices
- 1930s and after WW2 quality became a critical component of the war effort - military began using sampling techniques for inspection MIL105D of military-specification standards and Walter Shewhart Statistical Quality Control techniques – advent of SPC
- 1950s Japanese embraced the teachings of Juran and Deming, rather than concentrating on inspection, focused on improving all organizational processes through the people who used them – started QCC and CWQC.
- By 1970s, U.S. industrial sectors such as automobiles and electronics had been challenged by Japan's high-quality products. Oil embargo

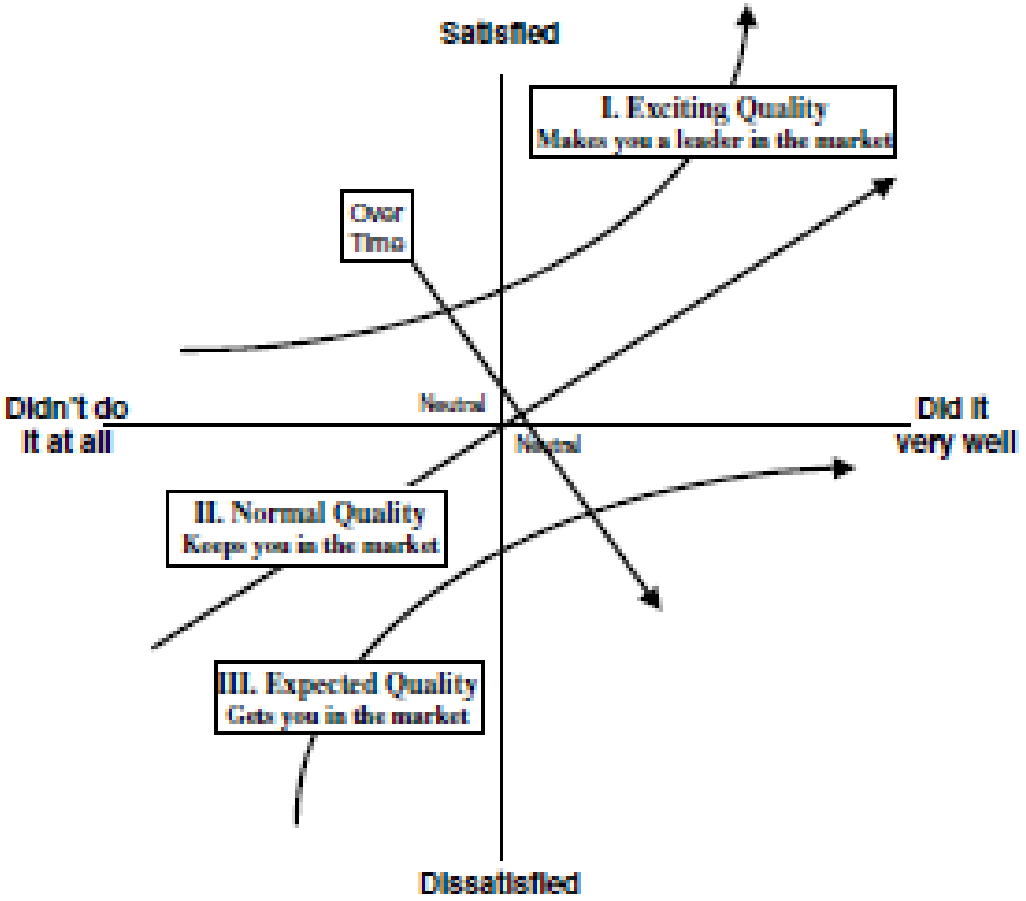
Quality History and Evolution

- Late 1980s U.S. response to Japan, emphasizing not only statistics but approaches that embraced the entire organization, became known as total quality management (TQM).
- 1990s until 2000- TQM started to be popular
- ISO 9000 System, Business Excellence Framework, Quality Awards, Six Sigma, Lean , Lean Six Sigma was introduced in the last 15 years
- Use of the term TQM has faded particularly in the developed nations, but its practices continue.
- Quality movement seems to have matured beyond TQM
- New quality systems have evolved from the foundations of Deming, Juran and the early Japanese practitioners of quality, and quality has moved beyond manufacturing into service, healthcare, education and government sectors.

Dimensions of Quality

Quality Aspects	Product : Automobile	Service : Undergraduate Education
Quality in Design	Concept – Design process – Development – Prototype – Equipment and Process Planning Trial Car, Prototype (P1), P2 P3	Design of Program Learning Outcomes, Curriculum development, facilities preparation, Labs, Process planned - registration, program, accommodation, support facilities, etc
Quality in Process	Decide the tools, jigs fixtures, material handling systems to be used, decide the production systems, Determine Standard Operating Procedures, Time,	All processes must be delivered based on requirements, the content, the approach, the program outcomes achievement monitoring
Quality of Employees	Competent, knowledgeable and well trained staff in design, manufacturing, support services, marketing, logistics, at all levels – shop floor employees to general managers	Technical support staff are competent and well trained, Academic staff must be able to teach well based on the designed curriculum, student's and university's expectations. Professor are well established and known. Support staff provide services required for academic as well as non-academic activities within and outside campus
Quality of Suppliers	Parts and materials must be quality assured, vendor selection system, auditing, evaluation system, Inspection Items Results	Quality of materials used in the teaching and learning process, in classrooms, laboratories, e.g. engineering machine shop traditional lathe machine, advanced processing using CNC
Quality of Sales /After Sales	Spare parts, warranty claims system, sales and service quality	Information for graduation convocation, transcript requests, alumni support, life long learning – postgraduate studies
MAIN OUTPUT	**High quality cars able to perform during design life**	**Graduates able to contribute to society – economic and social well being**

Kano Model - VOC



JRE 11.6 The kano model. (From Wm. Eureka and N. Ryan, The Customer Driven pany, American Supplier Institute, Livonia, MI, 1988. With permission.)

What is the exciting feature?

Total Quality Thinking – Philosophy and A Business Model

Definition of TQM (BS 4778:1991)

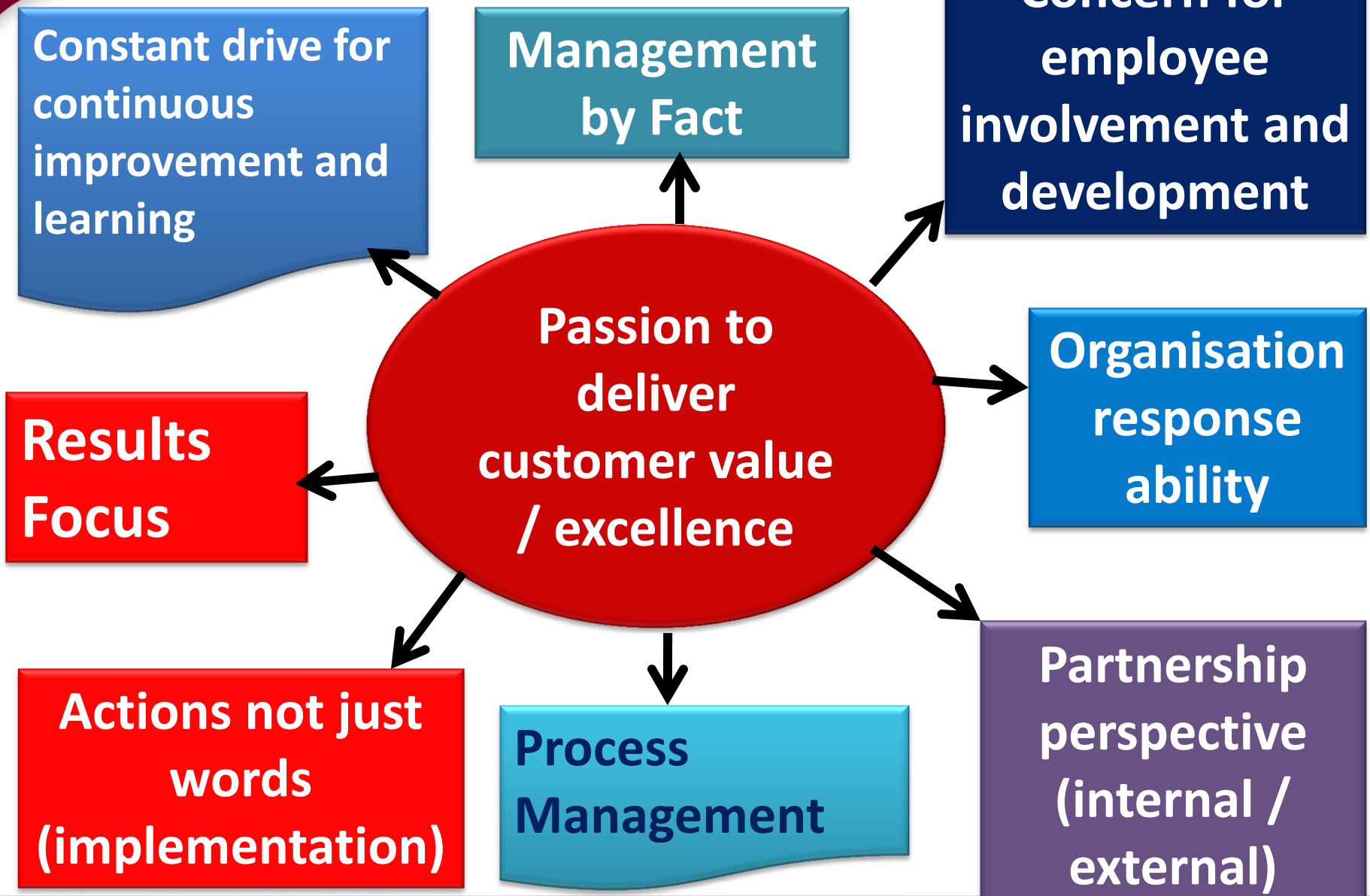
- A management **philosophy** embracing **all activities** through which the **needs and expectations** of the **CUSTOMER** and **COMMUNITY**, and the **objectives of the ORGANIZATION** are satisfied in the most efficient and cost effective manner by **maximizing the potential of ALL employees** in a continuing drive for **improvement**.

Total Quality Management

Managing enterprise wide interconnected processes with full understanding and knowledge for exceeding customers needs towards achieving organizational and industry goals

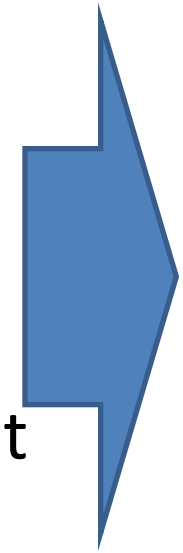
Quality Control
Quality Planning
Quality Improvement
Quality Assurance
Quality Tools

TQM Elements



TQM Principles

- Management Leadership
- Customer Satisfaction
- Employee Involvement
- Continuous Improvement
- Supplier Quality Management
- Performance Measures



Translate into Total Quality Practices

Quality Leaders

1. Give attention to external and internal customers
2. Empower, not control subordinates
3. Provide resources, training and conducive work environment to help them do their jobs
4. Emphasize improvement than maintenance
5. Emphasize prevention – pro-active
6. Encourage collaboration rather than competition
7. Train and coach, not direct and supervise
8. Learn from problems – opportunities for improvement
9. Continually try to improve communications
10. Continually demonstrate commitment to quality
11. Choose suppliers on the basis of quality not price
12. Establish organizational systems that supports quality efforts
13. Encourage and recognize team efforts

Customers

- **Who is customer?**

  Anyone impacted by the product or process delivered by an organization.

External customer: The end user as well as intermediate processors. Other external customers may not be purchasers but may have some connection with the product.

Internal customer: Other divisions of the company that receive the processed product.

What is product?

The output of the process by organizations - goods (e.g. automobiles, missile), software (e.g. a computer code, a report) or service (e.g. banking, insurance)

Customer Satisfaction

Two dimensions: Product features and Freedom from defects

- Product features – ***Quality of design***.

  Examples in manufacturing industry: Performance, Reliability, Durability, Ease of use, Esthetics etc.

  Examples in service industry: Accuracy, Timeliness, Friendliness and courtesy, Knowledge of server etc.

- Freedom from defects – ***Quality of conformance.***

  Higher conformance means fewer complaints and increased customer satisfaction.

Customer Behavior

- An average customer with a complaint tells 9-10 people; if it is resolved he/she only tells **5** people.
- For every complaint received, there are **twenty** others that are not reported.
- It costs 5-10 times more in resources to replace a customer than it does to retain one.
- Companies spend 95% of service time redressing problems and only 5% trying to figure out what made the customer angry.

(Source: Winning Back Angry Customers, Quality Progress, 1993)

Measuring Customer Satisfaction

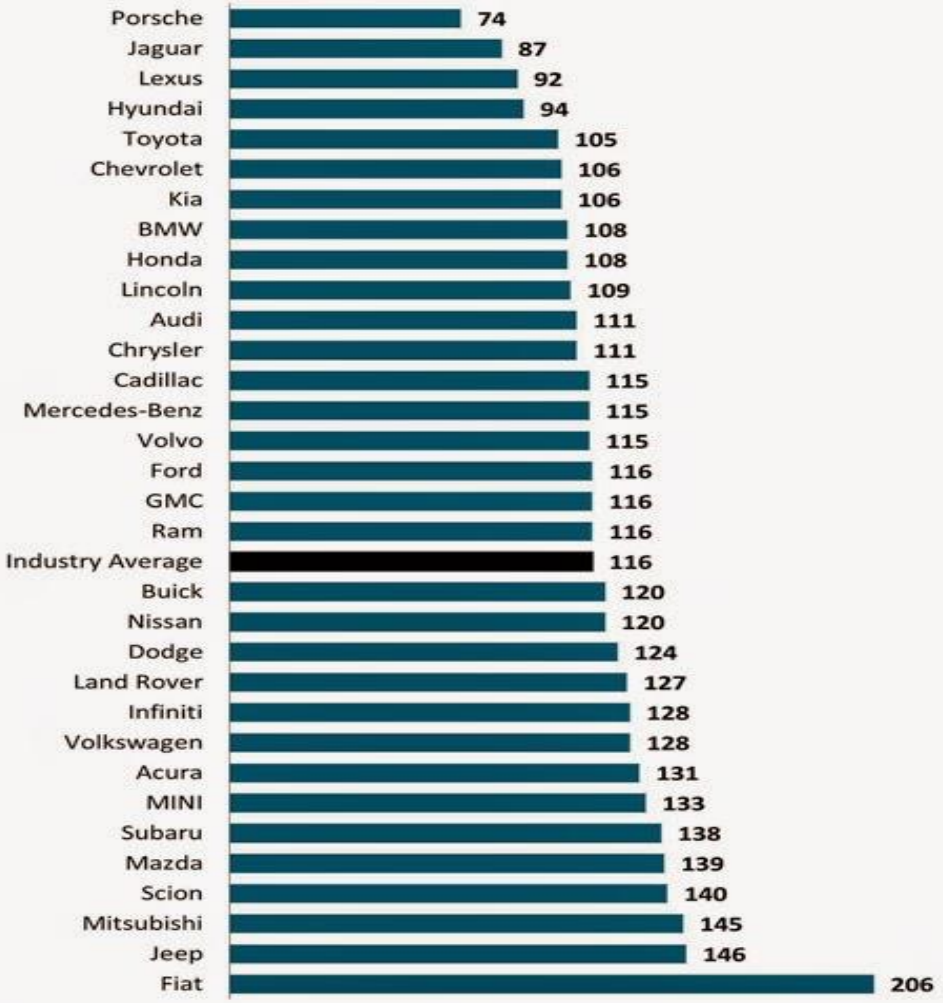
- Example: J.D. Power -- Initial Quality Survey measures customer satisfaction - problems per 100 vehicles.
- Effect of J.D. Power IQS on automotive quality?
  - 1998: 176 problems per 100 vehicles
  - 2005: 118 problems per 100 vehicles
  - 2013: 113 problems per 100 vehicles
  - 2014 : 116 problems per 100 vehicles

Source : J.D. Power 2014 US IQS http://www.jdpower.com/press-releases/2014-us-initial-quality-study-iqs

J.D. Power
2014 U.S. Initial Quality Study℠ (IQS)

2014 Nameplate IQS Ranking

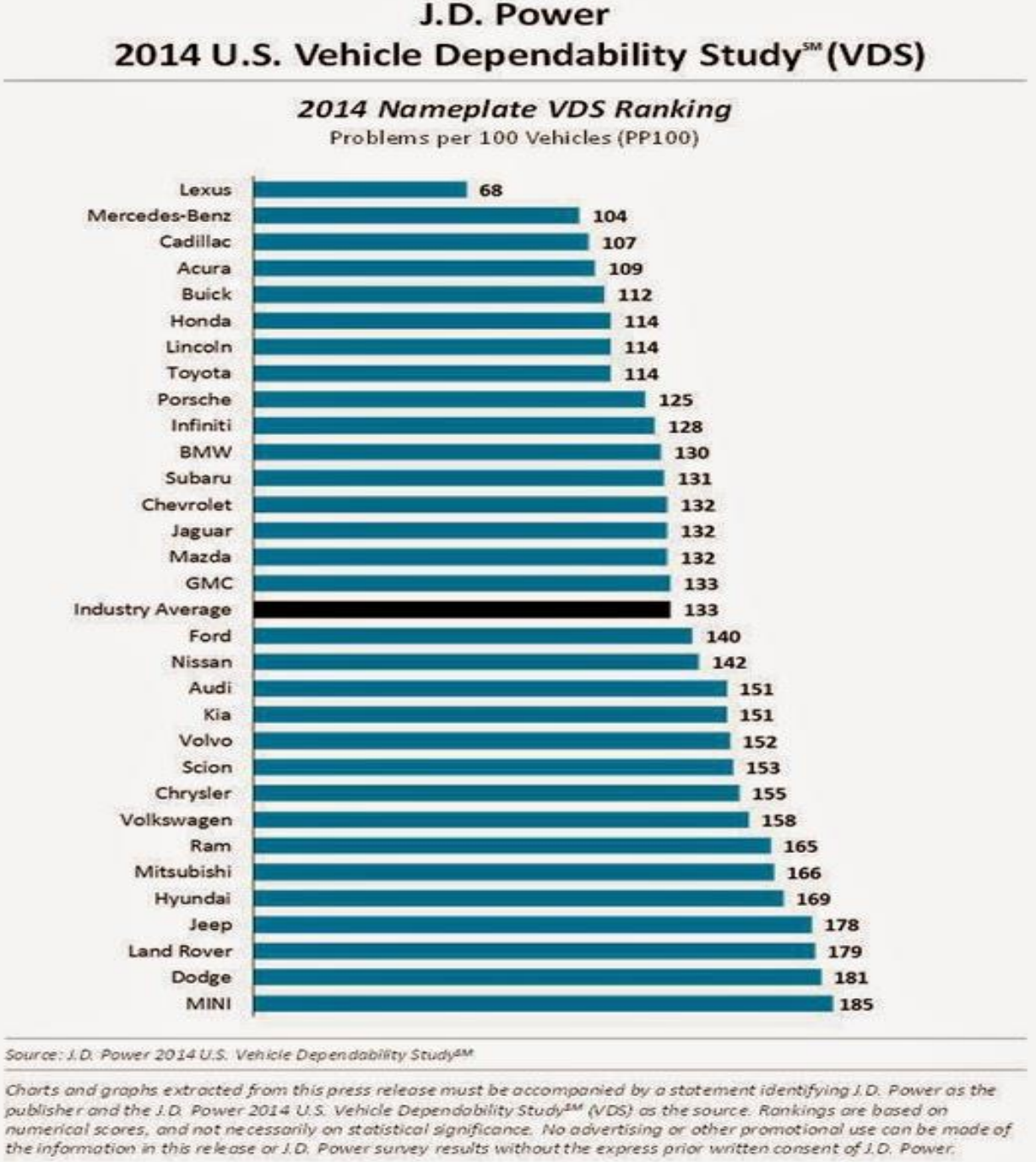
Problems per 100 Vehicles (PP100)



Source: J.D. Power 2014 U.S. Initial Quality Study℠

Charts and graphs extracted from this press release for use by the media must be accompanied by a statement identifying J.D. Power as the publisher and the study from which it originated as the source. Rankings are based on numerical scores, and not necessarily on statistical significance. No advertising or other promotional use can be made of the information in this release or J.D. Power survey results without the express prior written consent of J.D. Power.

VDS - measures problems experienced after three years of ownership.
Source: http://www.jdpower.com/press-releases/2014-us-initial-quality-study-iqs



Methods to Collect Customer Satisfaction Data

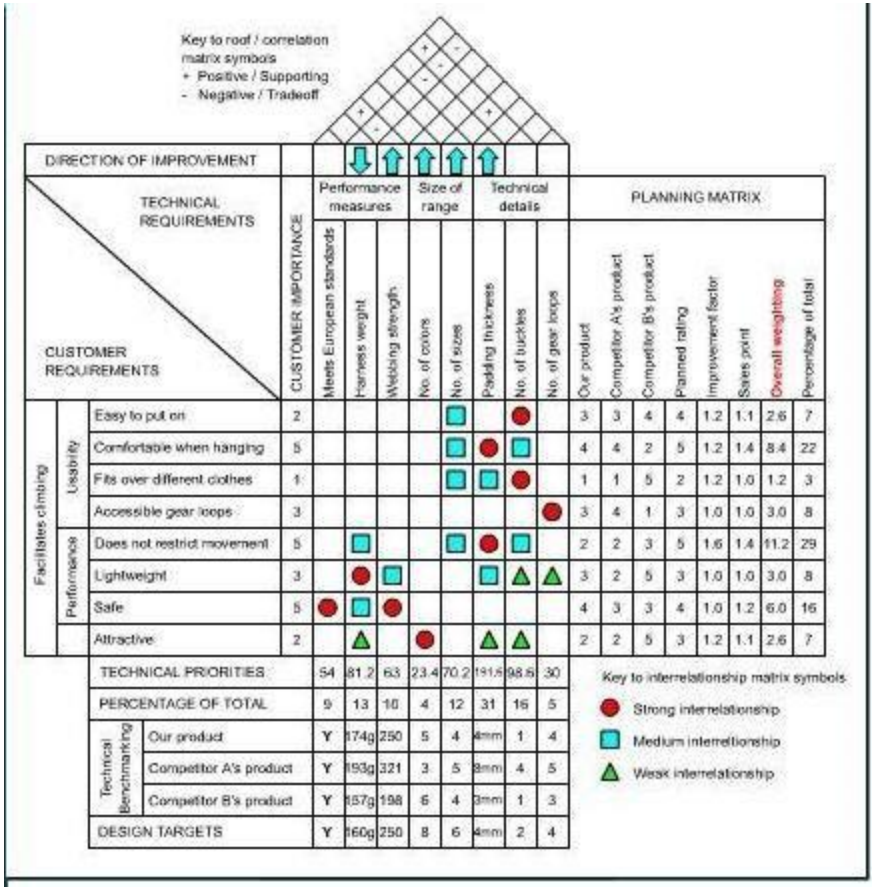
- Negative Feedback Analysis
  - customer complaints, warranty claims, repair records…
  - focus on problems
  - concern: many dissatisfied customers do not complain (1/20 complain).
- Proactive Feedback (ask customers for their opinions)
  - examples: customer surveys, focus groups, “employees” as customers.
  - advantage: identify key product features and assess levels of performance.
- Analysis of Competitor Products
  - examples: Benchmarking, Tear Down Analysis
  - advantage: Know your competitor

Identifying Customer Needs

Some Methods

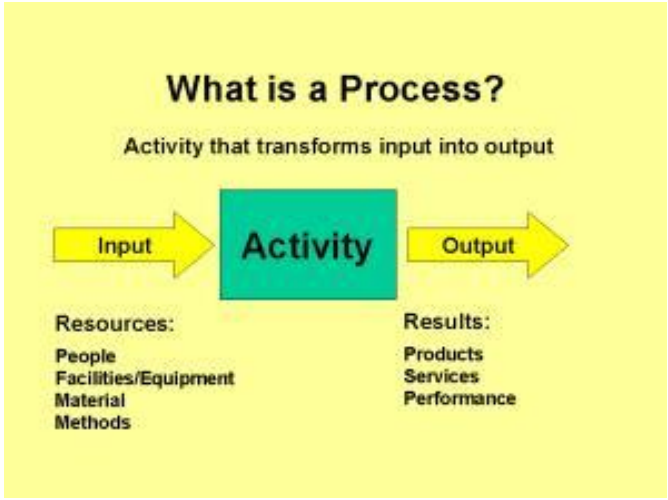
- focus-group discussions
- individual and group interviews
- surveys
- comment cards
- study repair and return data
- customer complaints
- warranty claims
- analyze competitor products

Quality Function Deployment (QFD) - Voice of Customer

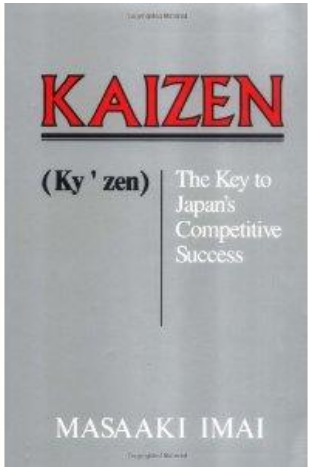


Process management

- Planning and administrating activities to *achieve high quality in business processes*; identifying *opportunities for improving quality* and operational performance – ultimately, *customer satisfaction*.
- Process improvement to reduce errors and rework.
- Value-added processes – essential for achieving and maintaining competitive advantage. (Design process, Production/Delivery process, Quality Processes, Purchasing,etc)



Kaizen

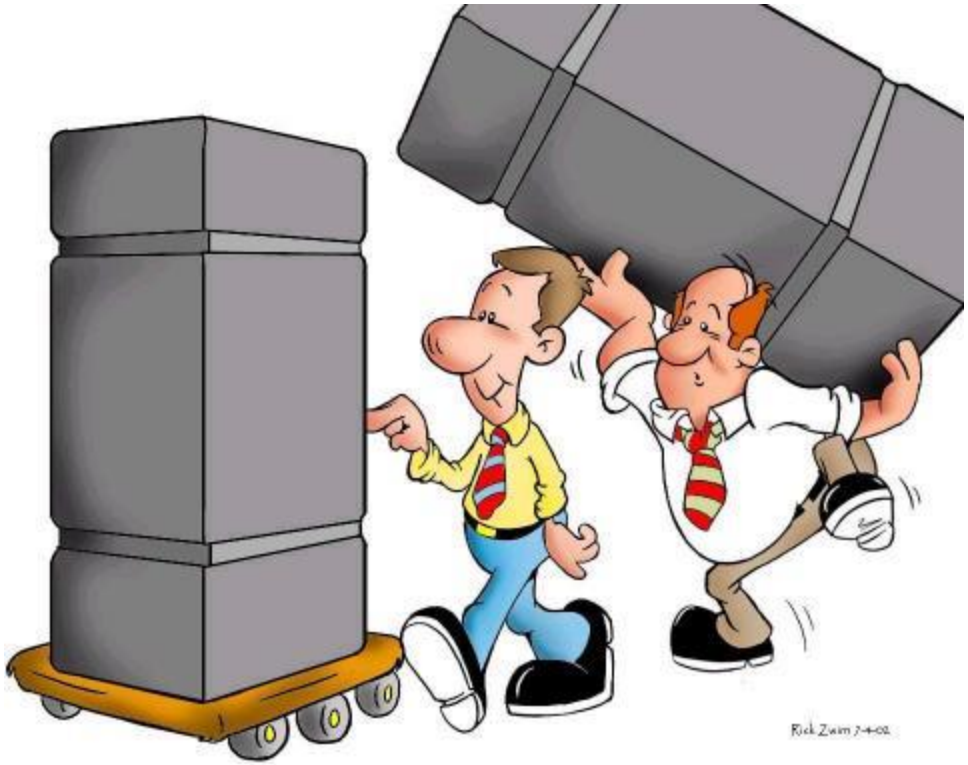


- Kaizen is a philosophy that defines management's role to encourage and implement small improvements
- Everyone, everything, everywhere
- Improvements made at little or no expense, without sophisticated techniques or expensive equipments

改善

Kai = Change Zen = Good

Kaizen - Continuous Improvement



Make your choice = Kaizen or Not to Kaizen


NUH's Quality Improvement Journey
NUHS Way
A long-term way of doing things where we keep learning how to deliver the best care to our patients with the least waste.
Vision for NUHS Way
Quality Care & Service
Our NUHS Way...
Text alerts help NUH save lives
Scarless surgery with robotic hands
三周可知心脏检测结果

Supplier Quality Management

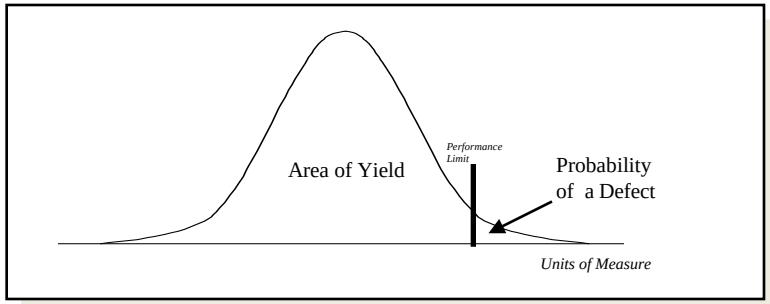
1. Define integrated supplier quality assurance system
2. Need system for evaluating genuine, high potential and select only those qualified suppliers
3. System that provide joint quality planning and execution
4. Require statistical evidence of quality
5. Certify suppliers, ISO 9001, TS 16949, Ford Q1, GMP
6. Develop and apply Supplier Quality Ratings/Assessment System

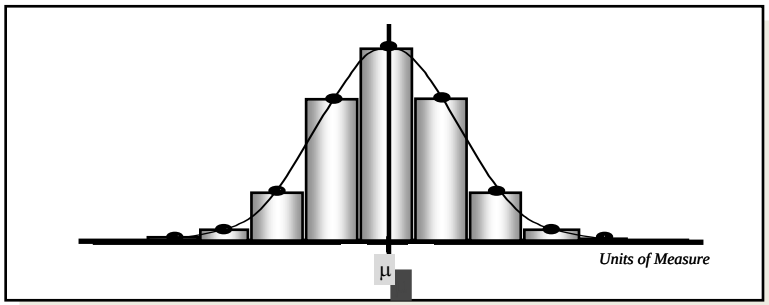
Strategies for supplier relationships

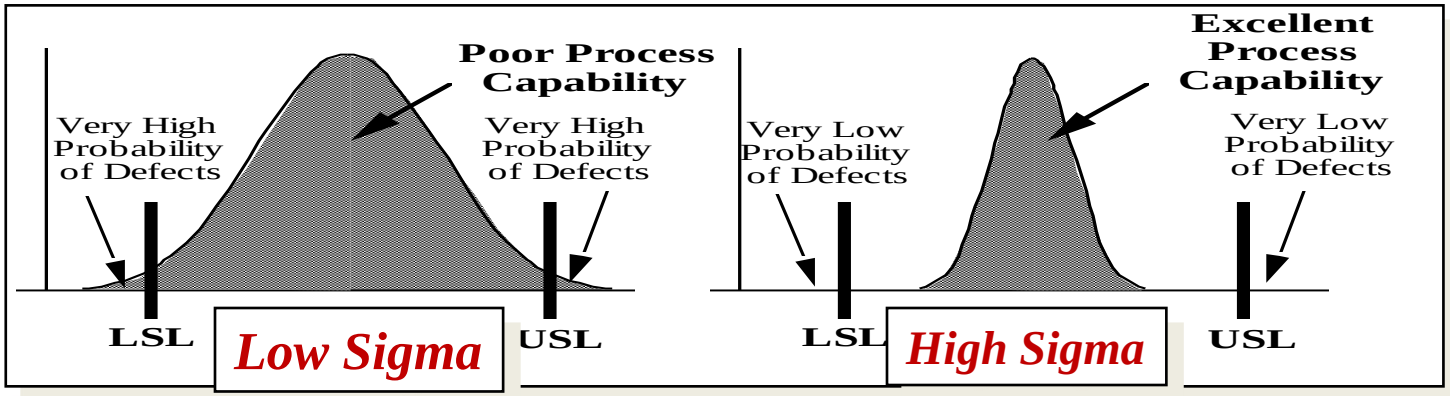
Criteria	Traditional Approach	Long Term Partnership
Philosophy	"keep suppliers on their toes"	"mutual dependence"
Supply base	Large supply base	Few suppliers - "single sourcing"
Contract length	Often short term contracts	Often long term contracts
Awarding contracts	Low cost bid	Negotiated
Supplier costs	Either company or supplier wins	Share cost savings (win-win)
Cooperation	Cooperation as needed; company protects knowledge	Frequent joint problem solving

Statistical Thinking

- All work occurs in a system of interconnected processes
- Variation exists in all processes
- Understanding and reducing variation are the keys to success



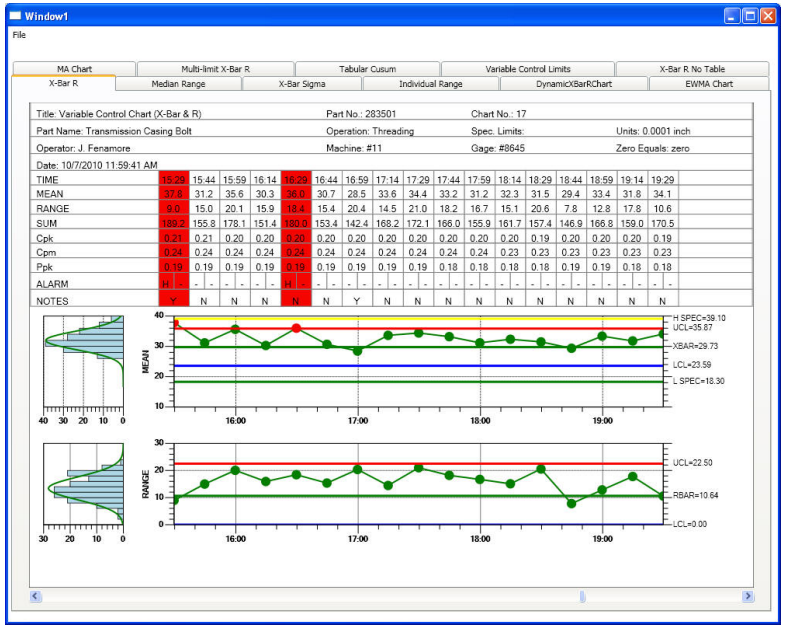


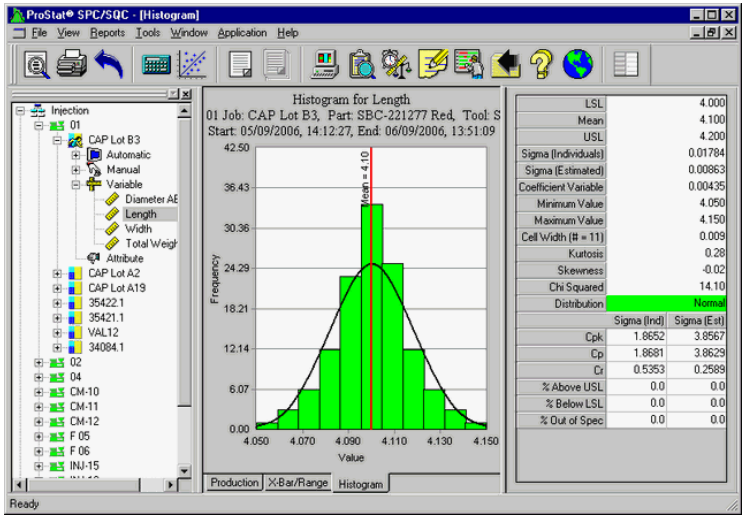


The Normal Curve and Process Capability – Cp.Cpk

Statistical Process Control (SPC)

- Variability in the process – chance causes and assignable causes of variation
- Need to understand variation through knowledge of statistics – Normal distribution (± 3 σ = 99.73%)





Six Sigma

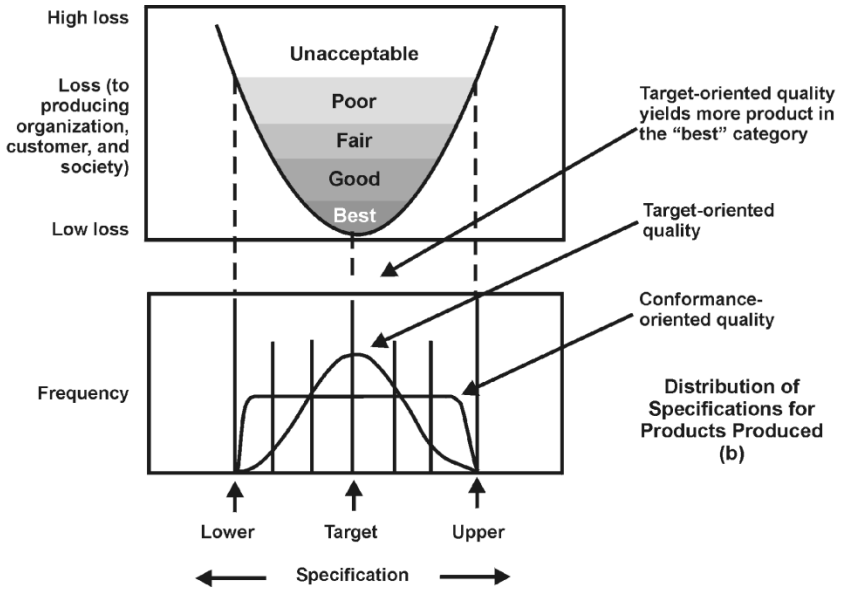
Developed by Bill Smith, a senior engineer at Motorola, in 1986 to standardize the way defects were tallied.

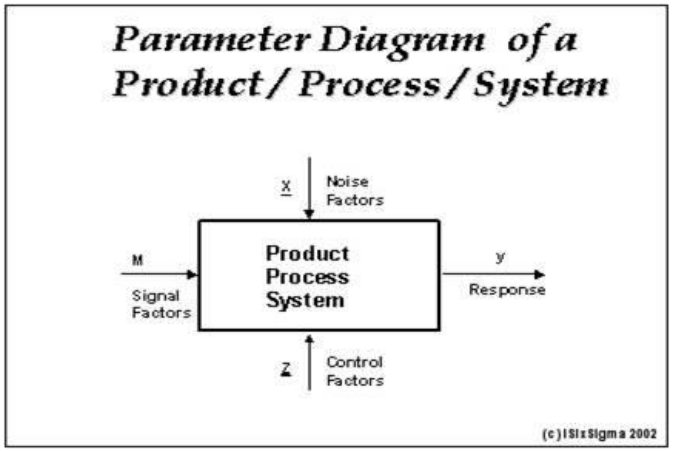
- Sigma is the Greek symbol used in statistics to refer to standard deviation which is a measure of variation.
- Putting “six” to “sigma” combines a measure of process performance (*sigma*) with the goal of nearly perfect quality (*six*).

Six Sigma Methodology

- DMAIC
  - Define, Measure, Analyze, Improve, Control
  - Used to improve existing processes
- DMADV / DFSS (DESIGN FOR SIX SIGMA)
  - Define, Measure, Analyze, Design, Verify
  - Used to develop new processes or implement new technologies
  - May be referred to as DFSS
- Process Management
  - Reviewing and analyzing an entire work process from end to end (*BPR*)

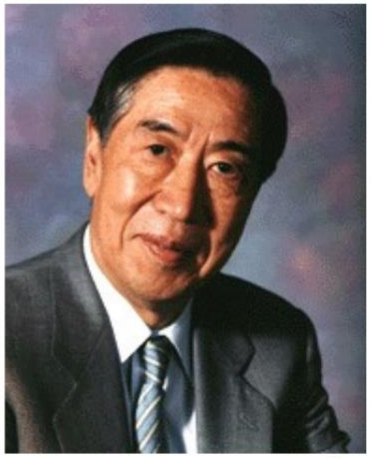
Taguchi Methods





Who is Dr. Genichi Taguchi?

- Born in 1924 in the town of Tokamachi, Japan
- Studied Textile Engineering and earned his doctorate from Kyushu University (Japan) in 1962
- Developed much of his thinking in isolation from the school of Ronald Fisher (Factorial DOE), only coming into direct contact in 1954.
- Pioneered his method with Dr. Yuin Wu in 1966 while consulting with Bell Labs



Ingersoll Rand

2

Orthogonal Array	No of experiments	No of factors	Max no of factors at theses levels			
			Level 2	Level 3	Level 4	Level 5
L-4	4	3	3	-	-	-
L-8	8	7	7	-	-	-
L-9	9	4	-	4	-	-
L-12	12	11	11	-	-	-
L-16	16	15	15	-	-	-
L-'16	16	5		-	5	-
L-18	18	8	1	7	-	-
L-25	25	6	-	-	-	6
L-27	27	13	-	13	-	-
L-32	32	31	31	-	-	-
L-'32	32	10	1	-	9	-
L-36	36	23	11	12	-	-
L-'36	36	16	3	13	-	
L-50	50	12	1		-	11
L-54	54	26	1	25	-	-
L-64	64	63	63	-	-	-
L-'64	64	21	-	-	21	-
L-81	81	40	-	40	-	-

Quality Human Resource

- TQM requires employee development & employee cooperation.
- Top management must:
  - provide workers with the necessary skills and knowledge.
  - create a quality-minded culture among employees.
- A quality culture that:
  - nurtures high-trust relationships.
  - has a shared sense of commitment.
  - believes that continuous improvement is for the common good
  - respect for humanity

Award Models as Total Quality Framework

Deming Prize

- One of the highest awards on TQM (Total Quality Management) in the world.
- Established in 1951 in commemoration of the late Dr. William Edwards Deming
- Taught Japanese statistical quality control after the World War II
- His teachings helped Japan build its foundation to an excellent level product quality recognized as one of highest in world
- Deming Prize Application 2014

Malcolm Baldrige Award

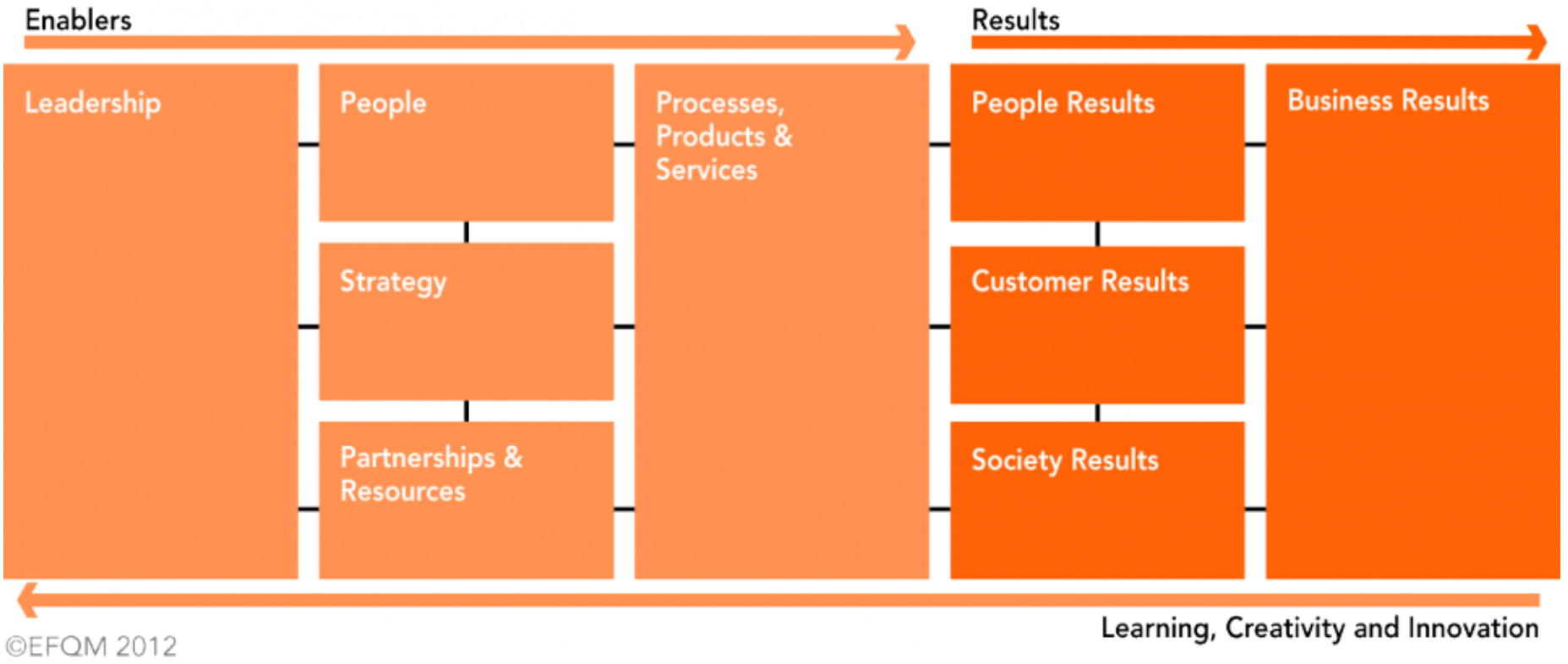
- Award established by the U.S. Congress in 1987 to raise awareness of quality management and recognize U.S. companies that have implemented successful quality management systems.
- Awards can be given annually in six categories: manufacturing, service, small business, education, healthcare and nonprofit.
- Named after the late Secretary of Commerce Malcolm Baldrige, a proponent of quality management.

Baldrige Criteria for Performance Excellence

1.Leadership: How upper management leads the organization, and how the organization leads within the community.
2.Strategy: How the organization establishes and plans to implement strategic directions.
3.Customers: How the organization builds and maintains strong, lasting relationships with customers.
4.Measurement, analysis, and knowledge management: How the organization uses data to support key processes and manage performance.
5.Workforce: How the organization empowers and involves its workforce.
6.Operations: How the organization designs, manages and improves key processes.
7.Results: How the organization performs in terms of customer satisfaction, finances, human resources, supplier and partner performance, operations, governance and social responsibility, and how the organization compares to its competitors.

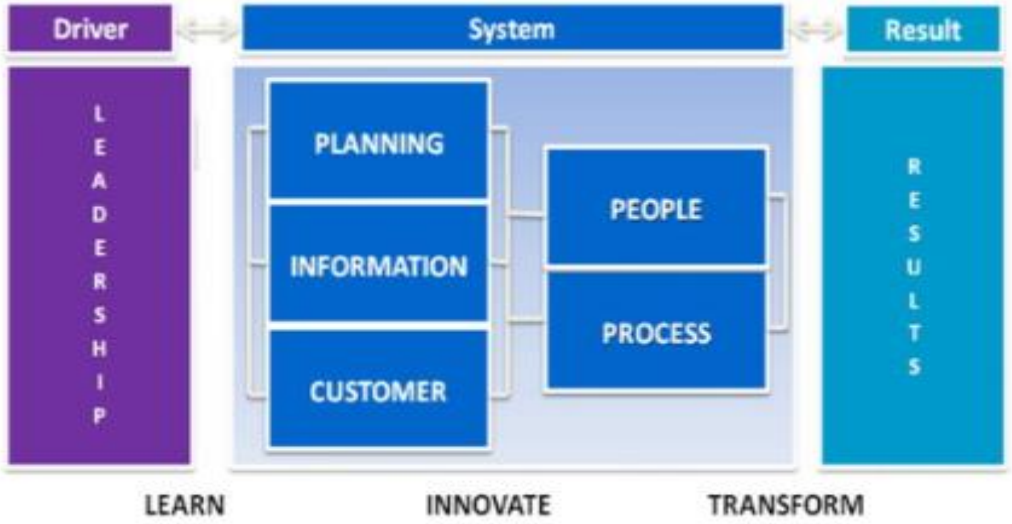
New 2015 Baldrige Performance Excellence F/w Criteria

EFQM Excellence Model



THE BUSINESS EXCELLENCE FRAMEWORK

Figure 1: Business Excellence Framework



The Business Excellence Framework comprises seven excellence indicators which are Leadership, Planning, Information, Customer, People, Process and Results. It has the following basic elements which are driver, system and results.

Seven Excellence Dimension

1. Leadership:
   - Leadership addresses how leaders develop and facilitate the achievement of the mission, vision and develop values required for long term success.

Following photos from Toyota Motor Corporation that explain how this great organization follows the principles of Total Quality with 5S, Visual Control in their factories and offices


Assembling with white gloves.
Easy access to tools
Visual alarm that indicates problems.


5S
Chairs below table to save space.

5S – all material identified and in its place. In the furniture, the wheels to facilitate moving.

Board filled by hand. Checklist (beside) is also, made manually.

Skill matrix

Research in UTM on TQM, Business Excellence, Lean

On going and Completed Research in UTM (since Feb 2000-now)

- Development of a Benchmarking Implementation Framework for Small and Medium Sized Enterprise (Baba Md Deros)
- QM Practices Automotive Thailand and Malaysia (Norhayati Zakwan)
- Critical factors and Self Assessment Tool for Quality Engineering (QE) Practices in Malaysia and Indonesia Automotive Companies (Nilda T Putri)
- Impact of TQM practices with Mediating Effects of Tools and Techniques on Business performance in Automotive Industry in Malaysia (co-supervisor) (Mohd Fauzi Ahmad)
- Practical Sound Quality in Automobile (Zainal Fitri Zainal Abidin)
- Lean Six Sigma and Strategic Control Framework (Nurul Fadly Habidin)

- Lean Sustainability(Rasli Muslimen)
- PMS in Oil and Gas Saudi Arabia (Awad Harbi)
- UAE Award Winners Lessons and Sustainability (co-sup) (Mehran Doulat)
- Future of Quality in Malaysia(Farhad)
- Sustainable Manufacturing Performance Tool for Automotive Companies (Elita Amrina)
- Integration of Web-based Failure Mode and Effects Analysis with TRIZ Inventive Problem Solving Methods (Ammar Ali Awad)
- Relationship between Statistical Process Control Success Factors and Organizational Performance(Jafri Mohd Rohani)
- Human Values Identification and Assessment Tool for TQM Implementation (Muhammad Noman Malik)
- Learning Organisation Dimensions to Sustain Lean Implementation - Comparative Study between New Zealand And Malaysian Manufacturing Companies (Affandi Zainal Abidin)

- Business Feasibility Model for Businesses Processes in an Automotive Supply Chain (Halim Shah Hamzah)
- Quality Management Implementation in Sudan (Sharafeldin Hamed Ahmed)
- Quality Management Systems in Petronas Projects(Mohd Latiff Ahmad)

Future research directions

Implementation and Innovation

"… big open issue is on quality initiative implementation. Many organizations fail to stay the course on implementation, and fall away. I know many companies that have made progress yet failed to embed it deeply enough, then it falls back. Perhaps those who know a lot about quality concepts may not know enough about **change management**." (Samson, 2012)

Implementation and Innovation

- Recurring issue with many large organizations, and even some Quality Award Winners recipients is implementation
- A lot has to do with management succession and transition and strive for short-term financial improvement.
- How can organizations **sustain** quality? Is it simply a role of leadership, or are other factors at play? Need research

Implementation and Innovation

- Need to study those enduring **top-tier** enterprises on a global basis
- Can offer insight into enterprise traits, leadership, management, talent, structure, business model, regulatory and cultural environments that create the enduring enterprise

Implementation and Innovation

- Innovation is one of the Baldrige core values and concepts
- Although several articles on innovation and creativity in quality have appeared, considerable opportunity exists
- TRIZ Systematic Innovation Methodology promises excellent opportunity for integrating with Quality Management

Cross-disciplinary Research

- How to integrate key concepts of quality management, performance excellence, sustainability, systems thinking, culture, and organizational learning with leadership and design to create value for multiple stakeholders.

Business Excellence Obstacles

(Yusof and Farhad,2014)

No	Soft Implementation barrier	Mean
1	Lack of knowledge about the quality tools and practices	3.41
2	Costs of consultancies and training in excellence	2.65
3	Lack of awareness about the benefit and positive result of excellence	2.65
4	Lack of time to devote to excellence	2.53
5	Lack of actual support/commitment of top management	2.35
6	Lack of process to support employee involvement	2.29
7	Lack of awareness of tools and techniques available	2.29
8	Lack of communication	2.18
9	High expectation for quick result	2.18
10	Poor measurement system and data handling	2.00
11	Lack of actual empowerment to make operational decisions	1.94
12	Lack of quality system	1.76
13	Frequent change of personnel in senior executive team	2.29

Future of Quality - Key forces of change
(Yusof and Farhad 2014)

No	Key forces of change	Mean
1	Innovation	3.68
2	Globalization	2.88
3	Value creation	2.84
4	Consumer awareness/expectation	2.80
5	Aging population	2.76
6	Increasing rate of change	2.64
7	Social responsibility	2.64
8	Workforce of future	2.52
9	Outsourcing	2.12
10	Partnering	2.04
11	New dimensions for quality	1.88
12	Environmental concern	1.84
13	Global responsibility	1.76

Key Trends Transforming the Future of Quality

Research report : A Leadership Prescription for the Future of Quality
A Report from The Conference Board Quality Council 2008

Quality's professionals must develop and better use more strategic thinking skills to adapt to 4 key forces of change influencing organizational strategies and business results.

1. Globalization
2. Customer sophistication
3. Talent management and leadership issues
4. Environmental concerns and social responsibility

Challenges in managing excellence

(Brown 2013)

Themes	Issues
Embedding	Challenge 1: How is excellence integrated into the way the business operates so that it is a normal part of everyday business? Many organizations struggle to build continuous improvement, benchmarking, and the use of quality improvement processes into their mainstream activities
Providing Meaning	Challenge 2: How can the principles and processes of excellence have meaning for all throughout the organization? How does it affect me? How do I contribute? Unless both managers and employees can see how they have a role and what it is to participate in excellence then it is difficult for them to be involved and committed.

Challenges in managing excellence (Brown 2013)

Themes	Issues
Driving	Challenge 3: How is the effort and momentum maintained? What critical mass is required throughout the organization to provide ongoing drive?
Engaging	Challenge 4: Who drives and how engagement driven and achieved? How can the maximum number of organizational participants, both managers and employees, be engaged?
Not being onerous	Challenge 5: How can strategies, processes, and systems be pursued without being seen as considerable extra work? Linking to embedding but ensuring that it does not create work, rather an integral part of work
Consistency	Challenge 6: How do we ensure the message is consistent throughout the organization especially where there are multiple locations?

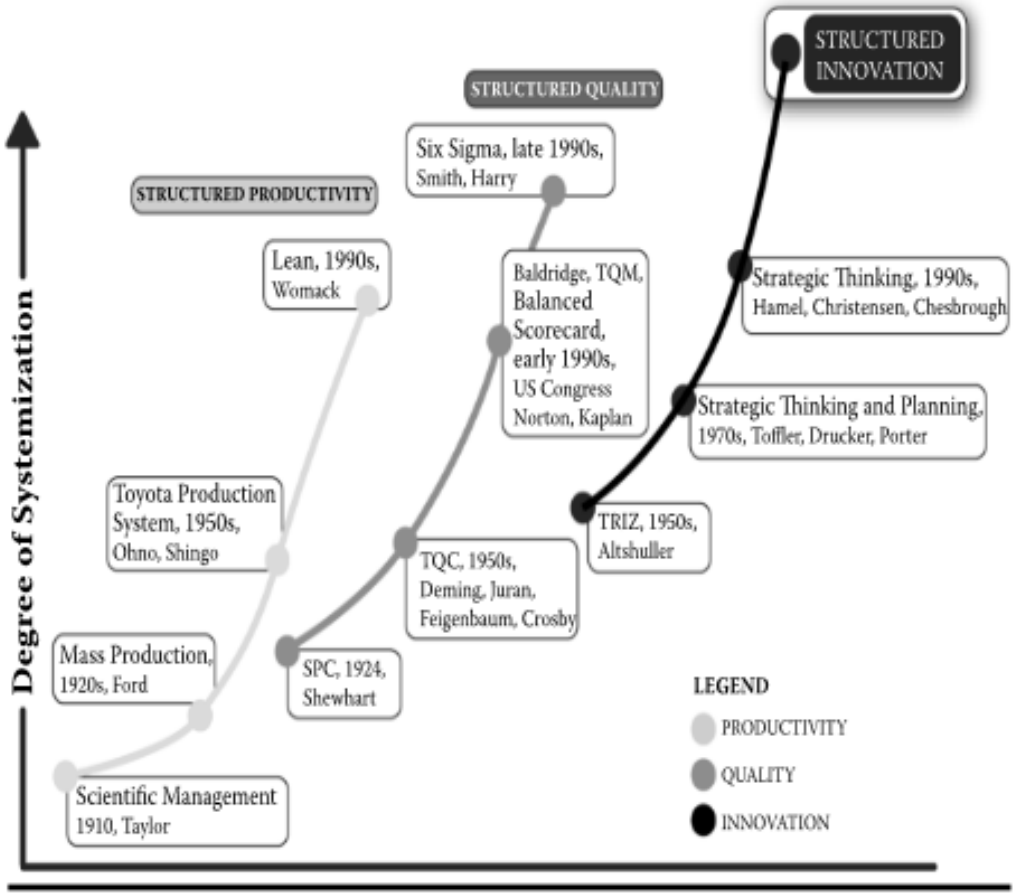


Figure 3.1 In the big picture of organizational capability, structured innovation is the next frontier for development and systemization.

of poor quality products in a short period of time with fewer resources could only take a company so far on the competitive landscape. In hindsight, it seems obvious and

Future research areas

- To further develop implementation approaches suitable and sustainable for small medium enterprises
- To integrate the philosophy of TRIZ Inventive Problem Solving approach and tools into Taguchi Methods which also focus on robust design of products and processes
- Supplier Quality – how to assist, become partners and improve their quality performance?
- Service quality: applying Lean and Six Sigma in services
- How to sustain business excellence – both in sustainability and environmental management

Final Thoughts for Practitioners and Industrialists

Why is it difficult to achieve TQM (or Business Excellence)?

- Do we believe in it? Is it difficult to implement?
- Do we perceive it as not our job to think about Quality and act upon it?
- **We** means = Leaders and Followers (i.e. Everyone = Management , Support Staff, Office Staff and Shop floor employees)
- Excellence is Never easy…. Patience, Perseverance, Persistence, Knowledge, Discipline
- Feigenbaum (author of TQC) said 'Quality is a moving target'
- Deming once said " Survival is not compulsory (for organizations)"

Some thoughts

- Total Quality Management is the process towards excellence in anything we do in an organization (and in life in fact)
- Need : Attitude change, Build Excellence Culture, Prevention Mentality, Long term and Future View (not short term thinking)
- Costs of Poor Quality will be reduced, Increased Employee Happiness Index, Customer Experience/ Satisfaction Index

Some thoughts

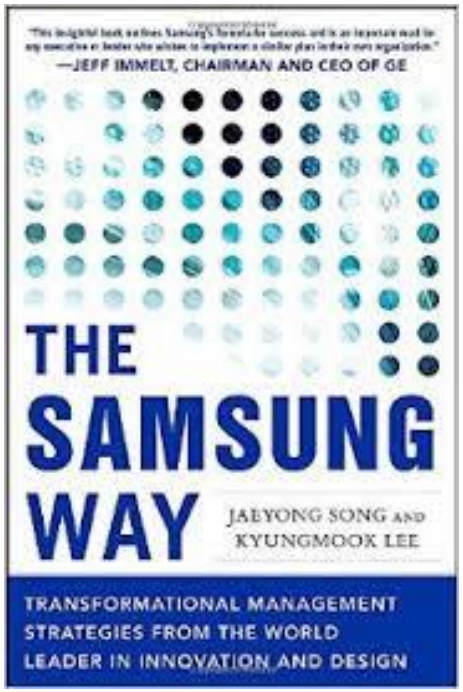
- Processes – includes all Quality Processes with value adding objectives – all work MUST add value.
- To customers – not bosses – use Value Stream Mapping and Supply Chain tools
- Supplier quality assurance – need genuine supplier partnership (need to assist in true sense, for example educating, collaborate not just reprimanding)
- Knowledge management and preservation of talents – don’t waste the brains you have

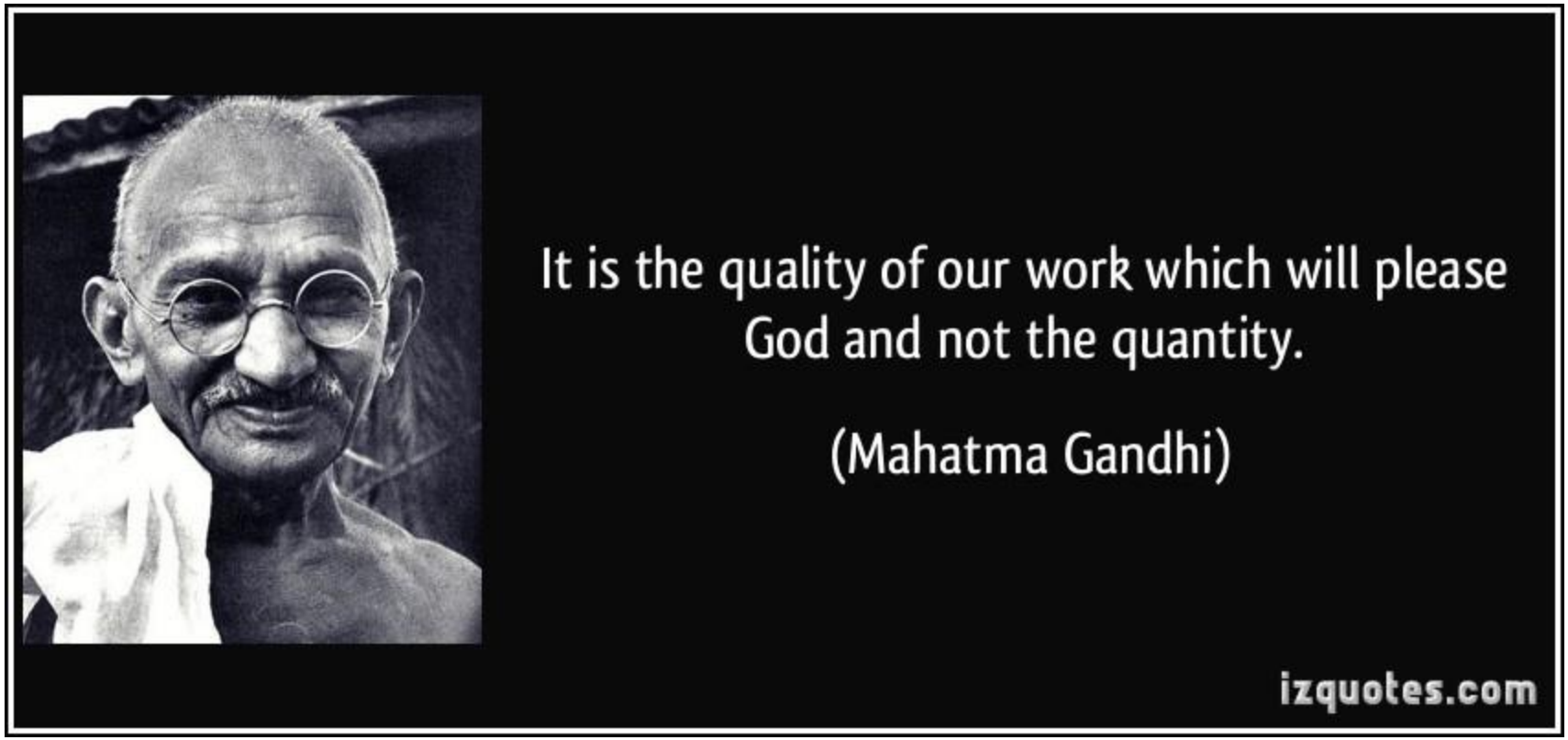
"It has been said that there will be two kinds of company in the future, companies which have implemented Total Quality and companies which are out of business"

(John Cullen, 1988, *Implementing Total Quality*)

The core concept of Samsung's quality-focused management can be summarized as "improve the quality of people to improve the quality of management to improve the quality of products and services"

Jaeyong Song and Kyungmook Lee in The Samsung Way (2014)




It is the quality of our work which will please God and not the quantity.
(Mahatma Gandhi)
izquotes.com

Meaning of hadith : **'Allah loves that whenever any of you do something, you should perfect it',** this means perfecting your work. Therefore, every worker has to master his job. Regardless of the amount of recompense, he has to do his work to perfection as prescribed." Moreover, Prophet Muhammad asked us to act responsibly when holding any position and when performing our work or attending to our obligations."

Awad alHarbi Quality and perfection as espoused in Islam, Article in New Straits Times Online 31 October 2014 http://www.nst.com.my/node/480534

Last Words

Shadid ibn Aws said: I remember two things the Messenger of Allah ﷺ said, "**Indeed, Allah has prescribed excellence in everything; so if you kill, then kill well; and if you slaughter, then slaughter well. Let one of you sharpen his knife so his animal feels no pain.**"

[Sahih Muslim, Book 21, Number 4810]

Book of Hunting and Gaming, Chapter: The command of excellence in slaughtering and killing

شَدَّادِ بْنِ أَوْسٍ قَالَ ثِنْتَانِ حَفِظْتُهُمَا عَنْ رَسُولِ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ قَالَ **إِنَّ اللَّهَ كَتَبَ الْإِحْسَانَ عَلَى كُلِّ شَيْءٍ فَإِذَا قَتَلْتُمْ فَأَحْسِنُوا الْقِتْلَةَ وَإِذَا ذَبَحْتُمْ فَأَحْسِنُوا الذِّبْحَ وَلْيُحِدَّ أَحَدُكُمْ شَفْرَتَهُ فَلْيُرِحْ ذَبِيحَتَهُ**

كِتَاب الصَّيْدِ وَالذَّبَائِحِ وَمَا يُؤْكَلُ مِنْ الْحَيَوَانِ – بَاب الْأَمْرِ بِإِحْسَانِ الذَّبْحِ وَالْقَتْلِ وَتَحْدِيدِ الشَّفْرَةِ

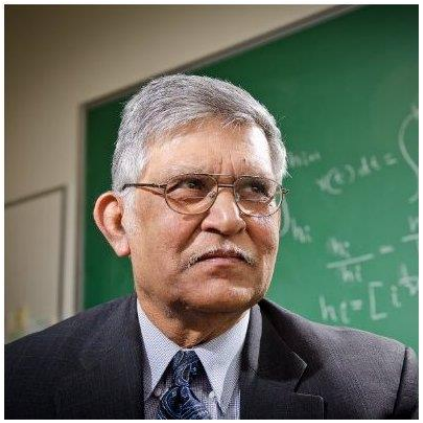
Take home lessons

- At what ever position or level in the organization - everyone have a role to play in advancing Quality in your work – office worker/cleaner up to CEO
- Whatever kind of job or function / department you work in you have to control, improve , and manage Quality of your work and the processes – seek knowledge
- Make Quality A Way of Life for yourself, and our country, and this world

Acknowledgment - Thank You

- My Phd Students and Graduates (11 Graduates and 16 in Process), RAs
- My Industry Colleagues
- My Fellow academics around the world including Japan, APIEMS, Robust Quality Engineering Society
- My Fellow colleagues in UTM, local IPTs
- My wife Noor Aisha, my children, family members and all my Friends from my schooldays, college both undergraduate and postgraduate, Facebook, LinkedIn, watsapp, Instagram
- Everyone who have supported me
- Forgive me if I miss out anyone.

PHOTO SLIDE



(1944 -)

Special dedication to my Guru
Prof MA Rahim – Professor of Quantitative Methods University of New Brunswick who advised me, guided me and mentored me during my early years in UTM in 1990s when he did his sabbatical leave. Even funded my first ever publication with him in Int Conf on Productivity , 1991. May Allah reward and bless him

Thank you for attending and listening .

どうもありがとうございました

جزاكم الله خيرا كثيرا

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