

Quality Control

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Defining Quality

- ASQ - “quality is a subjective term for which each person has his or her own definition”
- In technical usage, quality can have two meanings:
 - *the characteristics of a product or service that bear on its ability to satisfy stated or implied needs, and*
 - *a product or service free of deficiencies*



W. Edwards Deming –
“non-faulty systems”
Out of the Crisis



Joseph M. Juran –
“fitness for use”
Quality Control Handbook



Phill Crosby –
“conformance to requirements”
Quality is Free

Defining Quality - Different Views

Stout's View

$$\text{Quality} = \frac{\text{Performance}}{\text{Expectation}}$$

Customer's view (more subjective)

- the quality of the design (look, feel, function)
- product does what's intended and lasts

Producer's view

- conformance to requirements (Crosby)
- costs of quality (prevention, scrap, warranty)
- increasing conformance raises profits

Government's view

- products should be safe
- not harmful to environment



Quality Dimensions in Industry

▪ Manufacturing

- Performance
- Features
- Reliability
- Conformance
- Durability
- Serviceability
- Aesthetics
- Perceived quality

▪ Service

- Reliability
- Responsiveness
- Assurance
- Empathy
- Tangibles



History of Quality Paradigms

- **Customer-craft quality paradigm:**
 - design and build each product for a particular customer.
 - producer knows the customer directly.
- **Mass production and inspection quality paradigm:**
 - focus on designing and building products for mass consumption.
 - larger volumes will reduce costs and increases profits.
 - push products on the customer (limit choices).
 - quality is maintained by inspecting and detecting bad products.
- **TQM or “Customer Driven Quality” paradigm:**
 - potential customers determine what to design and build.
 - higher quality will be obtained by preventing problems



Need for a New Strategy? When?



Foreign markets have grown

- Import barriers and protection are not the answer.
- Free Trade Areas



Consumers are offered more choices

- They have become more discriminating.



Consumers are more sophisticated

- They demand new and better products.



Quality Improvement Approach

Passive / Reactive

- Setting acceptable quality levels
- Inspecting to measure compliance
- Activities : Inspection, Quality Control, Six Sigma

Proactive / Preventive

- Design quality in products and processes
- Identify sources of variation (processes and materials)
- Monitor process performance
- Activities : Quality Assurance (ISO 9000/QS 9000), Total Quality Management



Total Quality Management (TQM)



TQM Movement

- Ford Motor Company had operating losses of \$3.3 billion between 1980 and 1982.
- Xerox market share dropped from 93% in 1971 to 40% in 1981.

(Attention to quality was seen as a way to combat the competition.)

- Total - made up of the whole
- Quality - degree of excellence a product or service provides
- Management - act, art or manner of planning, organizing, leading, controlling

TQM is the art of managing the whole to achieve excellence.

TQM: A “Buzzword” Losing Popularity

- For many companies, the term TQM is associated with corporate programs (mid 1980s ~ early 1990s) aimed at implementing employee teams and statistical process control.
- Unfortunately, many companies were dissatisfied with the perceived results of these programs, concluding TQM does not work. WHY?????



What does TQM mean?

Total Quality Management means that the organization's culture is defined by and supports the constant attainment of customer satisfaction through an integrated system of tools, techniques, and training. This involves the continuous improvement of organizational processes, resulting in high quality products and services.

At it's simplest, TQM is all managers leading and facilitating all contributors in everyone's two main objectives:

1. **total client satisfaction** through quality products and services; and
2. **continuous improvements** to processes, systems, people, suppliers, partners, products, and services.



What's the Goal of TQM ?

“Do the right things right the first time, every time.”

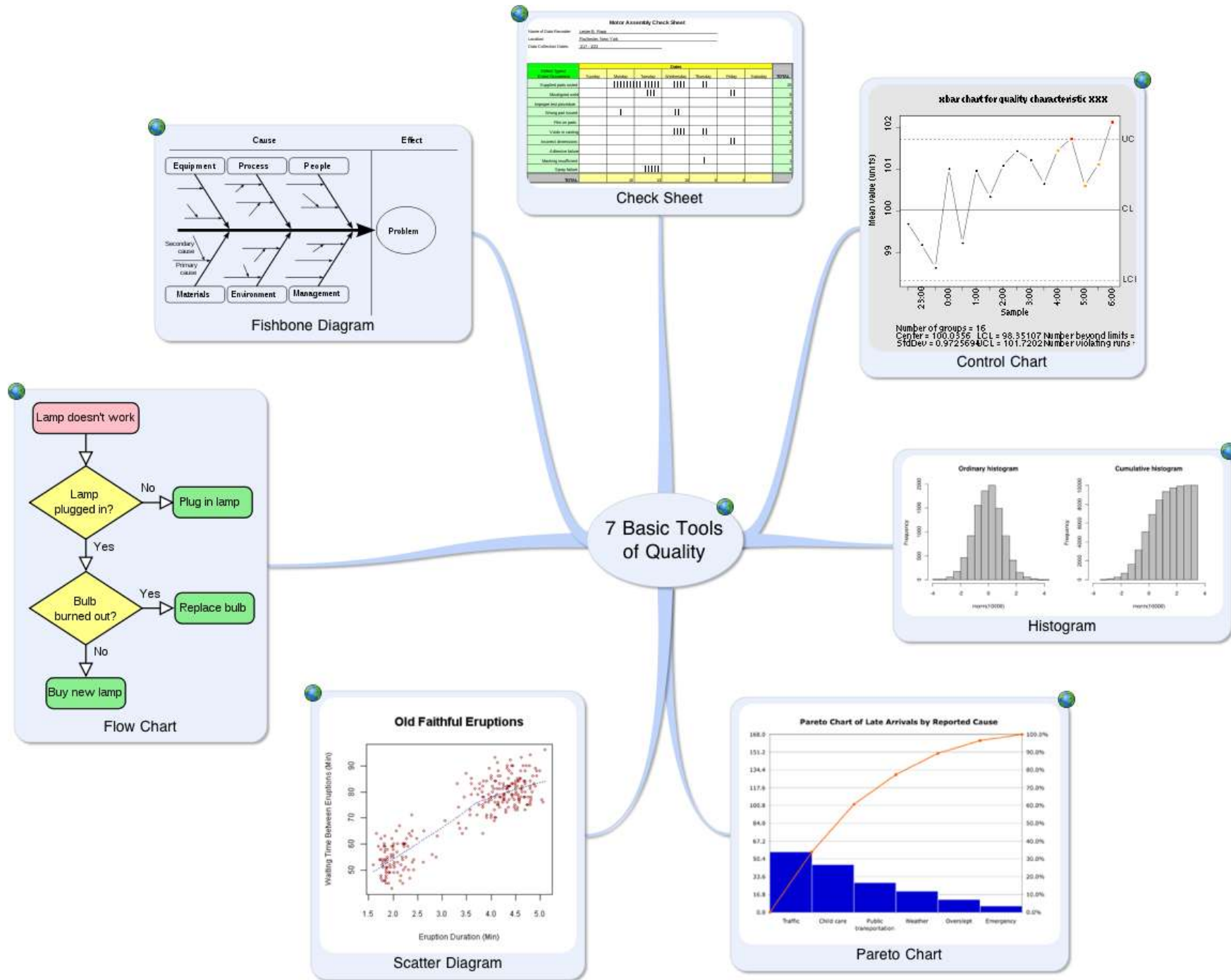


Basic Tenets of TQM :

1. The customer makes the ultimate determination of quality.
2. Top management must provide leadership and support for all quality initiatives.
3. Preventing variability is the key to producing high quality.
4. Quality goals are a moving target, thereby requiring a commitment toward continuous improvement.
5. Improving quality requires the establishment of effective metrics. We must speak with data and facts not just opinions.



7 Basic Quality Tools



7 Basic Quality Tools

Cause-and-effect Diagram

- (also called Ishikawa or fishbone chart) Identifies many possible causes for an effect or problem and sorts ideas into useful categories.

Check Sheet

- A structured, prepared form for collecting and analyzing data; a generic tool that can be adapted for a wide variety of purposes.

Control Charts

- Graphs used to study how a process changes over time.

Histogram

- The most commonly used graph for showing frequency distributions, or how often each different value in a set of data occurs.

Pareto Chart

- Shows on a bar graph which factors are more significant.

Scatter Diagram

- Graphs pairs of numerical data, one variable on each axis, to look for a relationship.

Stratification

- A technique that separates data gathered from a variety of sources so that patterns can be seen (some lists replace “stratification” with “flowchart” or “run chart”).

Learn detailed in :

<http://asq.org/learn-about-quality/seven-basic-quality-tools/overview/overview.html>





**KEEP
CALM
YOU'RE AN
INDUSTRIAL
ENGINEER**

