

History of SPC

1920's, Dr. Walter Shewhart and Bell Labs:

He developed the concept of control charts.

World War II:

SPC was mandated of American Manufacturers in critical DOD functions. Its value was recognized even then.

Post World War II:

SPC was discarded by most manufacturers because of its complexity and time consumption. Manufacturers had little trouble selling their products, therefore they had little incentive to maintain high quality standards. Other items which contributed to a concentration on production were:

- Very little competition abroad for U.S. firms
- Large labor force
- “Hungry” consumers
- High production capability due to war effort

Dr. Deming to Japan:

Frustrated by U.S. lack of interest, Dr. Deming took his ideas to Japan after the war. The Japanese were strongly motivated to improve their economic condition, and embraced Dr. Deming's ideas.

Revival Today:

Many factors are behind it. Among them are:

- Competitive environment demands high quality standards
- High raw material, energy, and labor costs
- Importance of the supplier relationship

Deming's 14 Points for Management

1. Create constancy of purpose toward improvement of product and service.
2. Adopt the new philosophy. Refuse to accept defects.
3. Cease dependence on mass inspection.
4. End the practice of awarding business on the basis of price. Require suppliers to provide statistical evidence of quality.
5. Find problems. Continually and forever make improvements.
6. Institute modern methods of training on the job.
7. Give all employees the proper tools to do the job right.
8. Drive out fear, so that everyone can work effectively.
9. Break down barriers between departments: encourage different departments to work together on problem solving.
10. Eliminate numerical goals, posters, and slogans that ask for new levels of productivity without providing specific improvement methods.
11. Eliminate work standards that prescribe numerical quotas: use statistical methods to continuously improve quality and productivity.
12. Remove all barriers to pride in workmanship.
13. Provide vigorous and ongoing education and retraining.
14. Clearly demonstrate management commitment to the above 13 points.

Some Key “Deming” Concepts

- We need to break down barriers between departments—We are all working toward the same goals.
- We need to involve operators to a greater extent in process decisions.
- We need to work more closely with fewer suppliers:

High Quality Input => High Quality Output

- Consistent quality is worth more
- We need to focus more on Quality than Productivity. If we do, Productivity is the result.
- Even the best worker can’t beat a bad system (red bead experiment)
- Quotas disregard quality...puts a ceiling on production
- Misguided manager “just doing the best...making things worse”

Quality Gurus

Philip Crosby

Landmark Book “Quality is Free” 1979

Raised awareness of the cost of quality, asserts that the cost of poor quality amounts to 20% of sales volume. Crosby’s four absolutes of Quality Management:

1. Quality means conformance to requirements.
2. Prevention, not detection is the means.
3. The performance measure is the cost of quality.
4. The performance standard is zero defects.

Dr. W. Edwards Deming

Landmark Book “Out of the Crisis,” 1982

NBC White Paper: “If Japan Can, Why Can’t We?,” 1980

The prestigious Deming Prize is awarded yearly in Japan for quality improvement in industry. (See information on Dr. Deming at the front of the appendix.)

Dr. Armand Feigenbaum

Landmark Book “Total Quality Control,” 1951

Emphasis on total quality control—a systematic application of quality concepts in all parts of the organization; quality and cost are complementary factors, rather than conflicting factors.

Dr. Kaoru Ishikawa

Landmark Book “Guide to Quality Control,” 1971 (English translation)

This book was written to introduce quality control practices in Japan, regarded by some as the best book on the subject as practiced in Japan.

Cause and Effect diagrams are also known as Ishikawa diagrams.

Dr. Joseph M. Juran

Dr. Joseph M. Juran

Landmark Book “Quality Control Handbook,” 1951

Founded the Juran Institute, has consulted extensively in Japan and around the world. Defines quality as fitness for use. Looks at quality improvement in a project-by-project, step-by-step manner.

Dr. Walter Shewhart

Landmark Book “The Economic Control of Quality,” 1931

Made many statistical contributions while at Bell Labs, including development of the Shewhart Control charts with 3 sigma limits. Also created rules for the presentation of data, and the Criterion of Meaning for operational definitions, which he considered key to industrial research. He was a mentor to many, his most familiar student being Dr. W. Edwards Deming.