



## TenStep Supplemental Paper

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### Joseph Juran – A Quality Legend

Juran began his career humbly at Bell System's Western Electric in the early 1920's. Like any other employee in a big company, he worked hard to get recognized and promoted. During World War II, he worked for the Foreign Economic Administration as an assistant administrator. He soon realized that he was not suited for work in big organizations, so he became a freelance consultant.

In addition to consulting, he began writing, researching, and lecturing on quality. His interest in writing led him to write articles for journals like the *ASQ (American Society for Quality)* and the *American Management Association*. Juran also wrote a number of books on quality, including *Juran's Handbook of Quality*, an international quality reference book.

Juran is the founder of the Juran Institute and the Juran Foundation (presently known as the Juran Center at the University of Minnesota). He was also the key person in starting the Malcolm Baldrige National Quality Award and has developed many widely used statistical tools for quality.

#### Statistical tools for quality improvements

In 1903 Bell Laboratories had many subscribers calling their central telephone exchange. Therefore, they had to increase the number of lines to connect to the central exchange. They decided to use a statistical method to make the decision. They collected data and used it to find the number of lines required during the times that traffic was the busiest and installed that many lines.

Bell Laboratories realized that these statistical methods would be of great use in factories. They sent a team of delegates to the Western Electric factory in 1926 to educate them about the importance of statistical tools. At that time, Juran was working as a junior engineer. The team met the chief inspector and formed a small committee on inspection, statistics, and economy. They decided to meet twice a year.

Since no one in Western Electric was familiar with statistical methods, they hired a professor from Chicago University to train them. About 20 managers and engineers, including Juran, attended the course.

Later, a small department with one head and two engineers, including Juran, was set up to aid the committee in its inspection. Juran then assisted the great mathematician Walter Shewhart during his plant visits. All this helped Juran to get involved in the development of statistical methods for quality.

In the beginning, no one accepted the statistical standards. However, there was a complete change after World War II. This was caused by a study headed by two professors, Eugene Grant and Ed Deming, that concluded that statistical tools were crucial for quality improvements in factories.

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Eugene Grant began giving free lectures about statistical methods. This resulted in the sharing of information between engineers of different companies and led to the formation of a number of quality societies. These societies later merged to form the American Society for Quality (ASQ).

### **The Japanese Quality Revolution**

Prior to World War II, the quality of Japanese products was so low that despite having low prices, they had a hard time selling their products. However, within 30 years there was a complete turnaround. How was this achieved?

Juran has called the Japanese quality revolution the greatest quality achievement in the last century. He lists several factors that led to this success:

- The involvement of top management in quality improvements
- Training all employees in quality - from top management to the lowest level workers
- Setting up goals for quality as the top priority in business plans. One of these goals was to achieve quality improvement “year-by-year”. By the 1970s, Japanese products were on par with those from the rest of the world.
- Encouraging workforce participation in quality improvement through “Quality Control Circles.”

### **Quality Levels in Western Countries Lag**

Despite having adequate technology for quality improvements, many organizations in Western countries have not been successful manufacturing quality products. Juran attributes this to a number of factors:

- The use consultants to achieve improvements in quality. Companies spent a lot of time learning what not to do, eventually leading many to stop once they have achieved a mediocre quality that is still sellable.
- The false belief that different businesses need different quality improvement programs because of different markets, technologies, and cultures. Juran, however, feels that although industries are different, almost all organizations face similar quality problems. Therefore, they need the same diagnostic and remedial tools to solve them.
- The belief that ISO 9000 registration can solve their quality problems. Juran disagrees with this. Many Japanese companies that have successfully produced high quality products have not achieved ISO 9000. Juran feels that the ISO 9000 series has been developed at a mediocre level. Therefore, only using the ISO 9000 quality program will not lead to high quality products
- Delegate the responsibility for quality improvement to lower level employees rather than make it the responsibility of top management.
- Believe that producing higher quality products is expensive. However, quality can be achieved in different ways.

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1. *Product characteristics*: Improving quality in the underlying product can be expensive because it requires product research, product development, and so on. However, Juran would consider this an investment rather than an expense because it will lead to higher returns in terms of increased sales and higher sales prices.
2. *Improving process quality*: Costs incurred due to internal failures (like scrap, rework, slow deliveries, and failure to deliver on time) and external failures (like field failures, lawsuits and safety problems) will be reduced if quality is improved. This saves time and money and makes the product more profitable as well.

### ISO 9000

Juran believes the ISO 9000 has been developed with a mediocre standard of quality. Therefore, the companies registered with it are restricting themselves to a mediocre quality level instead of trying to improve further. Customers generally prefer a certified company to an uncertified one. Many companies seek ISO registration, even though it is not obligatory, because it provides a marketing advantage over competitors.

### Six Sigma

Six Sigma is a process to reduce the number of defects in a product through process uniformity and process capability. Every process can be evaluated in terms of its uniformity. The process uniformity is compared with the tolerance limits to check whether the process is meeting standards. With process uniformity, a defective product can be easily identified.

Juran believes that Six Sigma is a good concept for quality improvements supported by old concepts. The marketing hype surrounding Six Sigma will only last until it is replaced by a more attractive and productive method.