

Notes

COMPETING WITH GLOBAL QUALITY CONTROL: LEARNING FROM JAPAN

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Techniques for Improving Quality

“If we learn only one thing from Japan,” says 3M Corporate quality director Douglas Anderson, “it should be that quality improvement depends on a systematic approach throughout the total organization. There are no quick solutions to quality. Rather, it must become a permanent, managed process that examines all products, procedures and processes on a continuous basis for constant improvement” [2].

At the 3M company five principles underlie the quality program:

- 1) Management commitment that starts at the top of the organization and must be built on the idea that quality improvement must be planned and actively managed like any other aspect of the business.
- 2) Quality calls for the conforming to customers' expectations.
- 3) Quality is attained through prevention-oriented improvement projects.
- 4) The objective is conformity to expectations 100 percent of the time.
- 5) Measurements of quality are based on indicators of customer satisfaction rather than indicators of self gratification. These include returns, lost business, sales adjustments, on-time deliveries, missed deadlines, exception reports, overtime worked and others [2].

In Japan, the Total Quality Control systems now used in the more successful organizations did not become reality overnight. Organizations spent over 20 years developing the techniques delivered by U.S. specialists such as W. Edward Deming and Joseph Juran. Their ideas were accepted by the Japanese to improve an economy not yet recovered from World War II. Due to the limited resources available in Japan, the ideas of using the resources efficiently and effectively contributed to the acceptance of the idea of Total Quality Control.

In order to achieve the success anticipated by the U.S. specialists, Japan had to have managers believe in the approach and remain committed to the techniques. One such manager, Dr. Kaoru Ishikawa, a major contributor to the development of total quality control in Japan, stated that it was a revolutionary management philosophy characterized by the following five strategic goals:

- 1) Seek quality before profits.
- 2) Develop employees infinite human potential through education, training, delegation, and positive reinforcement.
- 3) Build long-term consumer orientation, both outside and inside the organization. (leading Japanese firms known for quality products and services establish quality standards based on their market requirements, not on traditional financial considerations.)
- 4) Communicate throughout the organization with facts and statistical data, and use measurement as motivation.
- 5) Develop a company-wide total quality control system focusing all employees on the quality-related implications of every decision and action at all stages of the product or service development continuum from design to sales [3].

Japanese management demonstrate their support of the quality control systems by participating in various training sessions on Statistical Quality Control, Total quality control and participation in quality Control Circle programs. Additionally, Japanese workers receive an average of fifty days of training per year to improve their abilities and to help the employee to become an important component of the quality control system.

In Japan, all employees are indoctrinated to meet customer's quality requirements, directing their efforts and activities in a way that satisfies customer's quality needs. In fact, meeting the customer's demand for quality is the blueprint for improving products and services. The Japanese believe in a total commitment to excellence; the ability to provide satisfaction to customers by giving them: (1) a quality product, (2) a quality service, (3) affordable cost, and (4) timely delivery.

Inventory management is an example of Japanese management's commitment to quality control. The Japanese even utilize the "just in time" inventory concept with economic lot sizes of one. The Japanese are also experimenting with the idea of eliminating inventory (zero inventory) which they believe improves quality by unmasking mistakes and uncovering poor workmanship.

Many think culture plays a strong role in the success of quality control programs. However, the Japanese have successfully transplanted their management techniques to their U.S. affiliates.

Quality Cost Measurement

U.S. Industry is finally realizing the tremendous cost of ignoring quality. In traditional U.S. factories that cost is probably the largest item on their list of expenses, and it is generally larger than gross profit. Because the cost of quality is rarely broken out in detail, management usually has no idea of its true dimensions. When quality audits are performed, they invariably uncover huge "hidden plants" staffed and equipped just to find and fix defective products.

For instance, IBM estimates that mistakes cost \$1.00 to fix in the design stage, \$20.00

to fix at the tooling stage and \$50.00 to fix if the problem reaches the field [3]. The cost of rework does not help typical American companies compete with foreign competition which focuses on producing quality products. W. Edward Deming suggested that 85% of poor quality production of goods results from poor management not errors by employees [1].

Studies have shown that a typical factory invests a staggering 20 to 25% of its operating budget in finding and fixing mistakes. In some cases as many as one-quarter of all factory employees don't produce anything. They just rework things that were not done correctly the first time. When the expense of repairing or replacing flawed products is added to the total burden, "unquality" can amount to more than thirty percent of production cost.

The Japanese have learned to deal effectively with chronic problems through a program of total quality control. When products cost more than they should, quality periodically falls below the acceptable level.

However, American manufacturers fail to view total quality control as an organizational asset. Philip Crosby, author of *Quality is Free*, expresses some commonly held assumptions. The assumption that cost and quality are correlated is discredited in the cost comparison between doing a job right the first time and making a mistake, finding it, tracking the defective work and eventually making it right. Crosby concludes that organizations probably spend more time doing inferior work than if they adopted a clear, uncompromising, high-quality standard of zero-defects. Crosby suggests that by tracking the cost of quality, one will be guided to areas where improvement in both quality and efficiency can be made.

Quality cost information can alert executives to the potential impact of poor quality on financial performance.

Furthermore, quality cost reporting can help management improve productivity through an increased focus on conformance quality. The relationship between conformance quality, productivity, and production costs can be summarized in three brief statements:

- 1) Higher conformance quality means lower rejection rates.
- 2) Lower rejection rates mean less waste of materials, labor, and/or equipment time.
- 3) Less waste of inputs means greater output for a given level of inputs, resulting in lower costs per unit of output.

Increased productivity, achieved by producing a higher percentage of conforming products, can increase profits in a number of ways. One fundamental effect of increased productivity is lowering of unit costs. Furthermore, high quality products may sell at a premium.

Organizations need to rely on some consistent mechanism to monitor and report on performance of quality system objectives against the expected norms. Quality cost reports are periodic summaries of quality costs by organizational unit, by product, by any segment of interest, or for the organization as a whole. The reports typically organize costs based

upon types of quality cost incurred, like prevention, appraisal, internal failure and external failure.

The quality report shows various key factors relating to the operating environment for the period covered. It is important to note changes in level of activity because quality costs may have risen in each period. Quality reports showing trend rates for the organization against standard measures, can reduce some of the confusion of pure dollar reporting.

Quality costs are costs incurred either because inferred quality may exist or because poor quality does exist. Quality costs can be grouped into various categories based upon whether the costs are prevention, appraisal, and internal or external failure. Prevention costs are costs incurred to prevent poor quality products from being produced. Appraisal costs result from activities undertaken to prevent poor quality products from being processed beyond the point at which they become nonconforming or from being delivered to customers. Failure costs are incurred because poor quality of conformance does exist. While some of the internal failure costs can be identified easily, some are hidden within the normal operating tolerance. External failure costs are incurred when nonconforming products are shipped to customers. While most accounting systems will include most expenses, the opportunity cost of lost future sales is not a normal accounting type expense and can be subjective in nature.

Of the four types of quality costs, prevention costs generally are regarded as the most preferable on which management should concentrate its expenditures for quality. It is less costly to prevent the production of poor quality products than to incur appraisal, internal failure and/or external failure costs.

Conclusion

In a future characterized by intense competition and resource scarcity, successful companies will be those that produce the highest quality products at the lowest possible price. They will treat quality improvement as a continuous process, (in a spiral-like manner, as each phase of improvements is complete, the next begins). Furthermore they will emphasize design quality. Products will be reliable, easy, and economical to operate and service. As well as simple to manufacture. Finally, the successful companies will employ an organizational measure of quality costs which they will use to improve financial performance and their long term strategic posture.

Bibliography

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