

20.7: Reading- Producing for Quality

Producing for Quality

What do you do if you get it home and your brand-new DVD player doesn't work? What if you were late for class because it took you twenty minutes to get a burger and order of fries at the drive-through window of a fast-food restaurant? Like most people, you'd probably be more or less disgruntled. As a customer, you're constantly assured that when products make it to market, they're of the highest possible quality, and you tend to avoid brands that have failed to live up to your expectations or to producers' claims. You're told that workers in such businesses as restaurants are there to serve you, and you probably don't go back to establishments where you've received poor-quality service.

But what is *quality*? According to the American Society for Quality, quality refers to “the characteristics of a product or service that bear on its ability to satisfy stated or implied needs.”^[1] When you buy a DVD player, you expect it to play DVDs. When it doesn't, you question its quality. When you go to a drive-through window, you expect to be served in a reasonable amount of time. If you're forced to wait, you conclude that you're the victim of poor-quality service.

Quality Management

To compete today, companies must deliver quality goods and services that satisfy customers' needs. This is the objective of quality management. Total quality management (TQM), or quality assurance, includes all the steps that a company takes to ensure that its goods or services are of sufficiently high quality to meet customers' needs. Generally speaking, a company adheres to TQM principles by focusing on three tasks:

1. Customer satisfaction
2. Employee involvement
3. Continuous improvement

Let's take a closer look at these three principles.

Customer Satisfaction

Companies that are committed to TQM understand that the purpose of a business is to generate a profit by satisfying customer needs. Thus, they let their customers define *quality* by identifying and offering those product features that satisfy customer needs. They encourage customers to tell them how to make the right products, both goods and services, that work the right way.

Armed with this knowledge, they take steps to make sure that providing quality is a factor in every facet of their operations—from design, to product planning and control, to sales and service. To get feedback on how well they're doing, many companies routinely use surveys and other methods to monitor customer satisfaction. By tracking the results of feedback over time, they can see where they need to improve.

Employee Involvement

Successful TQM requires that everyone in the organization, not simply upper-level management, commits to satisfying the customer. When customers wait too long at a drive-through window, it's the responsibility of a number of employees, not the manager alone. A defective DVD isn't solely the responsibility of the manufacturer's quality control department; it's the responsibility of every employee involved in its design, production, and even shipping. To get everyone involved in the drive for quality assurance, managers must communicate the importance of quality to subordinates and motivate them to focus on customer satisfaction. Employees have to be properly trained not only to do their jobs but also to detect and correct quality problems.

In many companies, employees who perform similar jobs work as teams, sometimes called quality circles, to identify quality, efficiency, and other work-related problems, to propose solutions, and to work with management in implementing their recommendations.

Continuous Improvement

An integral part of TQM is continuous improvement: the commitment to making constant improvements in the design, production, and delivery of goods and services. Improvements can almost always be made to increase efficiency, reduce costs, and improve customer service and satisfaction. Everyone in the organization is constantly on the lookout for ways to do things better.

Statistical Process Control

Companies can use a variety of tools to identify areas for improvement. A common approach in manufacturing is called statistical process control. This technique monitors production quality by testing a sample of output to see whether goods in process are being made according to predetermined specifications.

Assume for a moment that you work for Kellogg's, the maker of Raisin Bran cereal. You know that it's the company's goal to pack two scoops of raisins in every box of cereal. How can you test to determine whether this goal is being met? You could use a statistical process control method called a *sampling distribution*. On a periodic basis, you would take a box of cereal off the production line and measure the amount of raisins in the box. Then you'd record that amount on a *control chart* designed to compare actual quantities of raisins with the desired quantity (two scoops). If your chart shows that several samples in a row are low on raisins, you'd shut down the production line and take corrective action.

Benchmarking

Sometimes it also helps to look outside the organization for ideas on how to improve operations and to learn how your company compares with others. Companies routinely use benchmarking to compare their performance on a number of dimensions with the performance of other companies that excel in particular areas. Frequent benchmark targets include L.L. Bean, for its superior performance in filling orders; 3M, for its record of introducing innovative products; Motorola, for its success in maintaining consistent quality standards; and Mary Kay Cosmetics, for its skills in inventory control.^[2]

International Quality Standards

As a consumer, wouldn't you like to know which companies ensure that their products meet quality specifications? Some of us would like to know which companies take steps to protect the environment. Some consumers want to know which companies continuously improve their performance in both of these areas—that is, practice both quality management and environmental management. By the same token, if you were a company doing a good job in these areas, wouldn't you want potential customers to know? It might be worth your while to find out whether your suppliers were also being conscientious in these areas—and even your suppliers' suppliers.

ISO 9000 and ISO 14000

Through the International Organization for Standardization (ISO), a nongovernmental agency based in Switzerland, it's possible to find this kind of information. The resources of this organization will enable you to identify those organizations that have people and processes in place for delivering products that satisfy customers' quality requirements. You can also find out which organizations work to reduce the negative impact of their activities on the environment. Working with representatives from various countries, the organization has established the ISO 9000 family of international standards for quality management and the ISO 14000 family of international standards for environmental management.

ISO standards focus on the way a company does its work, not on its output (though there's certainly a strong correlation between the way in which a business functions and the quality of its products). Compliance with ISO standards is voluntary, and the certification process is time-consuming and complex. Even so, hundreds of thousands of organizations around the world are ISO 9000 and ISO 14000 certified.^[3] ISO certification has become an internationally recognized symbol of quality management and is almost essential to be competitive in the global marketplace.

Six Sigma

Another approach to quality management in the United States was formulated at Motorola in 1986 and was named Six Sigma (6σ). The Six Sigma practices were based on W. Edwards Deming's work, TQM, and others and had similarities regarding continuous efforts at improvement involving everyone at the company. It emphasized a clear focus on achieving quantifiable financial returns from any Six Sigma project. To determine the financial return on a quality initiative, the **cost of quality (COQ)** must be determined. The cost of quality has two parts: the cost of prevention and the cost of failure (or nonconformance). The cost of quality is the sum of the cost of prevention and the cost of failure. If spending more on prevention reduces the cost of failure by an even greater amount, the total cost of quality is reduced.

- Cost of prevention
 - *Cost of conformance*. Cost to improve quality
 - *Cost of appraisal*. Cost to measure and evaluate quality

- Cost of failure
 - *Internal costs.* Repairing bad parts before shipment or retooling a manufacturing line to reduce failures
 - *External costs.* Managing returns, lawsuits, product recalls

Six Sigma identified individuals as experts in quality and awarded titles like Champion and Master Black Belt. The name Six Sigma refers to a process that has six standard deviations from the mean to either control limit that would ensure virtually zero defects. (In practice, the Six Sigma approach allows for a 1.5 sigma drift, so it is really a 4.5 sigma standard that allows approximately 3.4 defects per million products.) This approach was adopted by Jack Welch at General Electric with great success. By the late 1990s, about two-thirds of the top five hundred companies in the United States had begun Six Sigma projects, including Ford, which had allowed its quality programs to slip. To provide encouragement and a consistent standard, the U.S. government created the Malcolm Baldrige National Quality Award in 1987 to encourage companies to improve quality; the award was named for Malcolm Baldrige who was the U.S. secretary of commerce from 1981 to 1987.^[4] The criteria used to determine award winners are as follows:

1. Leadership of senior executives
2. Strategic planning
3. Customer and market focus
4. Measurement, analysis, and knowledge management
5. Workforce focus
6. Process management
7. Results

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1. “[Basic Concepts, Definitions](#),” American Society of Quality, (accessed November 3, 2011). ↩
 2. Charles J. Nuese, *Building the Right Things Right* (New York: Quality Resources, 1995), 102. ↩
 3. “[ISO Survey of Certifications](#),” 2009 International Organization for Standardization, (accessed November 2, 2011). ↩
 4. National Institute of Standards and Technology, “[Frequently Asked Questions about the Malcolm Baldrige National Quality Award](#),” November 25, 2008, (accessed August 14, 2009). ↩

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