

## 13.4: Organizational Efficiency

### Learning Objectives

1. Understand the eight dimensions of product quality.
2. Understand the five dimensions of service quality.
3. Learn about the Deming philosophy of quality management.
4. Learn about the fundamentals of Six Sigma quality management.

When considering effectiveness or efficiency improvements on an organizational level, one generally thinks in terms of programs: projects with some battery of tools and techniques. Quite often, the businessperson is confronted with choosing from a cornucopia of the most recent business fads. The fad de jour is tried and often found wanting. Eventually, businesspeople become inured to the latest hot trend, continue with their standard operations, and become less willing to try something new. This is extremely unfortunate because some of these programs offer the opportunity for significant improvements. Two such programs are quality management and lean thinking. Both approaches grew out of manufacturing environments. Most of the articles and books about them tend to emphasize manufacturing-based examples. However, this does not mean that they are limited to that domain. More and more service industries are recognizing that the adoption of quality management and/or lean thinking offers tremendous benefits in effectiveness and efficiency. The same can also be said about the acceptance of these business models by smaller firms. Although some quality and lean programs are presented as complete and complex systems requiring extensive training routines, many small businesses have adopted the underlying concepts without resorting to significant expenditures. They recognized that the promulgation of the underlying principles of quality and lean management can yield significant returns without significant expenditures.

### Quality Management

Quality is never an accident; it is always the result of high intention sincere effort intelligent direction and skillful execution; it represents the wise choice of many alternatives the cumulative experience of many masters of craftsmanship. Quality also marks the search for an ideal after necessity has been satisfied and mere usefulness achieved. “William A. Foster—‘Quality Is Never an Accident...’” *Quotegasm*, accessed February 4, 2012, [www.quotegasm.com/william-a-foster/william-a-foster-quality-is-never-an-accident](http://www.quotegasm.com/william-a-foster/william-a-foster-quality-is-never-an-accident).

William A. Foster

Throughout this text, the concept of customer value has been emphasized. Intimately linked to customer value is the notion of quality. Therefore, it is extremely unfortunate that for most people, businesspeople included, the term *quality* is either totally misunderstood or viewed from a rather narrow perspective. This stems from two reasons. The first is based on a correct assumption that quality is defined by the user (customer); however, many then go on to believe that because quality is subjective, it then becomes impossible to define. The second problem centers on the tendency to view quality, particularly in products, as singularly the result of the use of costly raw materials, components, careful craftsmanship, and detailed processes. It is assumed that together these expensive elements must necessarily produce a quality but costly outcome. In this belief system, if one wants to identify the quality of the product, one has to look only at the price tag. Quality is synonymous with cost. This is a huge error because, as will be shown, a true commitment to quality can reduce costs and expenses—and do so quite significantly.

### Quality in Small Business

To see the practical benefits of using the principles of quality management for small businesses, one can simply review the winners of the Malcolm Baldrige Award. This award, started in 1987, seeks to acknowledge businesses that have a solid commitment to quality. Awards were initially given in the categories of manufacturing, service, and small businesses; subsequently, three more categories were added: education, nonprofits, and health care. A sampling of two recent winners in the small business category clearly shows that the smaller enterprise can produce spectacular results by adopting quality management.

K&N Management, a 2010 winner, operates two fast-casual restaurants in Austin, Texas. With a strong commitment to quality, such as using iPads to gather quick survey data from customers, K&N saw its sales increase from \$3 million in 2000 to over \$7.5 million in 2010. Its gross profit was consistently related to quality. In 2010, K&N was named the “best place to work in Austin.” “2010 Award Recipient: K&N Management,” *Malcolm Baldrige*, accessed February 4, 2012, [www.baldrige.nist.gov/PDF\\_files/2010\\_K&N\\_Management\\_Profile.pdf](http://www.baldrige.nist.gov/PDF_files/2010_K&N_Management_Profile.pdf).

The 2009 winner in the small business category was MidwayUSA, an online retailer for gun owners and hunters. Again, MidwayUSA's commitment to quality has produced some impressive results. The firm has a customer retention rate of 98 percent. It had a growth rate of 25 percent for 2008, compared to a 10 percent rate for its nearest competitor. From 2003 to 2008, MidwayUSA saw its net profits increase from 2.5 percent to 10 percent. "2009 Award Recipient: MidwayUSA," *Malcolm Baldrige*, accessed February 4, 2012, [www.baldrige.nist.gov/PDF\\_files/MidwayUSA\\_Profile.pdf](http://www.baldrige.nist.gov/PDF_files/MidwayUSA_Profile.pdf).

These Baldrige award winners are only a few of the indicators that a focus on quality translates into improved customer satisfaction, improved employee satisfaction, and significant improvements to a firm's financials.

Without a fundamental understanding of what quality really means, it is impossible to achieve it—consistently. So how should one approach a useful definition of the term *quality*? Many authors suggest that when discussing quality, it is useful to distinguish between product quality and service quality. Today, there may be no clear-cut distinction between exclusively product-based businesses or exclusively service-based businesses. Few products can be viewed in isolation from supporting services. As an example, an automobile manufacturer clearly produces a product; however, few manufacturers would survive long if they totally excluded the area of follow-up services, such as vehicle maintenance across a car's lifetime. Likewise, many service businesses rely on ancillary products. An investment company provides a service; however, it may also provide its clients with investment perspective reports. Many view McDonald's as essentially a service company—the service being the delivery of fast food; obviously, the ancillary product is the food.

The literature indicates that rather than having a unitary definition of quality, it is important to identify the dimensions of quality. In a seminal 1984 article, David Garvin identified eight dimensions of product quality: **performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality**. David Garvin, "What Does 'Product Quality' Really Mean?," *Sloan Management Review* 26, no. 1 (1984): 25–43. Table 13.1 describes what these dimensions mean and gives examples. Garvin recognized that no consumer will find all eight dimensions equally important. However, to ensure success, a business must identify which of the eight dimensions are important to its customers. As an example, if we are dealing with a product such as a heart pacemaker, customers would be most interested in the reliability and durability dimensions of that product. If a customer is buying a car for street drag racing only, then that person's focus would be on the performance dimensions of the vehicle.

Table 13.1 The Eight Dimensions of Product Quality

Dimension	Characteristics	Examples
<b>Performance</b>	The primary measurable operating characteristics of a product.	<p>The following outcomes for each category are of greatest importance to consumers:</p> <ul style="list-style-type: none"> <li>• <b>Car.</b> Miles per gallon or acceleration time to go from 0 to 60 miles per hour</li> <li>• <b>Light bulb.</b> Wattage</li> <li>• <b>Laptop computer.</b> Amount of memory or speed of processor</li> <li>• <b>Copier.</b> Pages per minute or cost per page</li> </ul>
<b>Features</b>	The secondary operating characteristics of a product.	<p>The following outcomes for each category may not be initially seen as critical but often influence the purchasing decision of a consumer:</p> <ul style="list-style-type: none"> <li>• <b>Car.</b> Comfort of ride or the number of cupholders</li> <li>• <b>Light bulb.</b> The shade of light given off</li> <li>• <b>Laptop computer.</b> Size or brightness of the screen</li> <li>• <b>Copier.</b> Ease of use</li> </ul>

Dimension	Characteristics	Examples
<b>Reliability</b>	The probability that a product will function for a given period of time or how often it breaks down. This is most often measured by the mean time between failures (MTBF). This is the expectation of how long a product is expected to last.	<ul style="list-style-type: none"> <li>• <b>Light bulb.</b> Expected lifetime</li> <li>• <b>Electric watch.</b> Time between replacing batteries</li> <li>• <b>Copier.</b> Time between replacing toner cartridge or printer drum</li> </ul>
<b>Conformance</b>	The extent to which a product matches established standards. This is viewed by many as the critical component of quality and is the basis of statistical process control.	<ul style="list-style-type: none"> <li>• <b>Car.</b> How well replacement parts match original equipment manufacturer components</li> <li>• <b>Laptop computer.</b> Voltage measurements</li> </ul>
<b>Durability</b>	The expectation of how long a product will last and how it will function under various working conditions. This dimension refers to how well a product lasts over time and under different environments.	<ul style="list-style-type: none"> <li>• <b>Car.</b> Expected lifetime of engine or tires; how a car functions under temperature extremes</li> <li>• <b>Laptop computer.</b> Functionality after being dropped</li> </ul>
<b>Serviceability</b>	The speed, competence, and courtesy of repairs or maintenance of a product. This dimension corresponds to the ancillary service component of products.	<ul style="list-style-type: none"> <li>• <b>Car.</b> The conduct of scheduled maintenance or repairs</li> <li>• <b>Laptop computer.</b> Speed of return to computer after repairs; intact files after repair</li> </ul>
<b>Aesthetics</b>	This is how a product looks, feels, sounds, tastes, or smells. This is the most subjective of the eight dimensions. This dimension means that it is extremely important to consider design issues with respect to any product.	<ul style="list-style-type: none"> <li>• <b>Car.</b> The attractiveness of the exterior style of the vehicle; the luxuriousness of the dashboard</li> <li>• <b>Laptop computer.</b> Stylish exterior; unique colors; uniqueness of its operations, such as a new type of input device</li> </ul>
<b>Perceived quality</b>	Consumers often do not have direct evidence of objective measures of a product's quality—both tangible and intangible measures. This concept of quality is most influenced by brand names, advertising, and commonly held perceptions concerning a product. Powerful brands often provide the perception that a product is of higher quality.	<ul style="list-style-type: none"> <li>• <b>Car.</b> Rolls-Royce: finest quality car produced and commands a premium price</li> <li>• <b>Aspirin.</b> Compare prices for same number of tablets: generic bottle versus brand name version—price difference due to perceived quality.</li> </ul>

Another approach to examining quality, this time in the service context, is to explicitly consider quality as a comparison between a customer's expectations and a customer's perception of performance. Parasuraman, Zeithaml, and Berry argued in their 1985 seminal article that there were ten determinants (dimensions) of service quality: reliability, responsiveness, competence, access, courtesy, communication, credibility, security, knowing the customer, and tangibles. A. Parasuraman, Valerie A. Zeithaml, and Leonard L. Berry, "A Conceptual Model of Service Quality and Its Implications for Future Research," *Journal of Marketing* 49 (1985): 41. After some major research, they reduced this set to five dimensions: **tangibles**, **reliability**, **responsiveness**, **assurance**, and **empathy**. Valerie A. Zeithaml, A. Parasuraman, and Leonard L. Berry, *Delivering Quality Service: Balancing Customer Perceptions and Expectations* (New York: Free Press, 1990), 38. Again, it is critical to note that customers will not view all five dimensions as equally important. In fact, the relative rank of these dimensions may differ significantly across industries. The

approach of Zeithaml et al. has become well known as the **SERVQUAL** instrument, and it plays a prominent role in improving quality in service environments. The five service quality dimensions are given in Table 13.2. This SERVQUAL system explains the notion that quality is associated with a gap between expectations and perceptions. It identifies the following five types of gaps that a service organization should examine and attempt to minimize:

1. The gap between what customers expect and what a business believes are its customers' expectations
2. The gap between a business's evaluation of its own performance and how its customers evaluate its performance
3. The gap between a customer's experience and a business's specified level of performance
4. The gap between the communicated level of service by a business and what a customer actually experiences
5. The gap between a customer's expectation and actual experience.

From looking at these five gaps, it should be obvious that a full utilization of the SERVQUAL instrument is quite a challenge and might be beyond the capacity of most small businesses. That does not mean, however, that a business interested in providing its customers with quality service cannot apply some of the elements of the SERVQUAL instrument or use it as a conceptual template.

Table 13.2 The Dimensions of Service Quality

Dimension	Characteristics	Examples
<b>Tangibles</b>	The physical appearance of the facility, personnel, and communications media.	The first thing customers notice is appearances. This may involve the cleanliness of a facility, how brightly lit it is, the width of the aisles, or how personnel are dressed. A cheaply designed website may convey a totally inappropriate message about a business. It should be remembered that a business has only one chance to make a first impression. At its start, McDonald's emphasized not speed of service but the cleanliness of its facilities.
<b>Reliability</b>	The ability to perform the service correctly and consistently.	Reliability means performing the service correctly each and every time. One failure with a customer may destroy his or her faith in the capability of a business. FedEx emphasizes its guarantee to get a package there overnight— <i>each and every time</i> . An accounting firm must make sure that its clients' tax returns are done properly and submitted on time.
<b>Responsiveness</b>	The speed and courtesy to customer inquiries.	A customer who is put on "hold" for any length of time is on the path to becoming an ex-customer. This dimension requires all personnel to be well mannered and focus on the needs of the customer. Disney trains its park staff to recognize that they are not responding for the sixtieth time to the same inquiry; they are responding for the first time to the sixtieth individual who is asking that question.
<b>Assurance</b>	The extent to which the customer trusts and has confidence in the service provider.	A medical facility's survival depends on its customers' belief that they are receiving excellent medical care. The same is true for any professional service. Trust is built over time and is a fragile commodity.

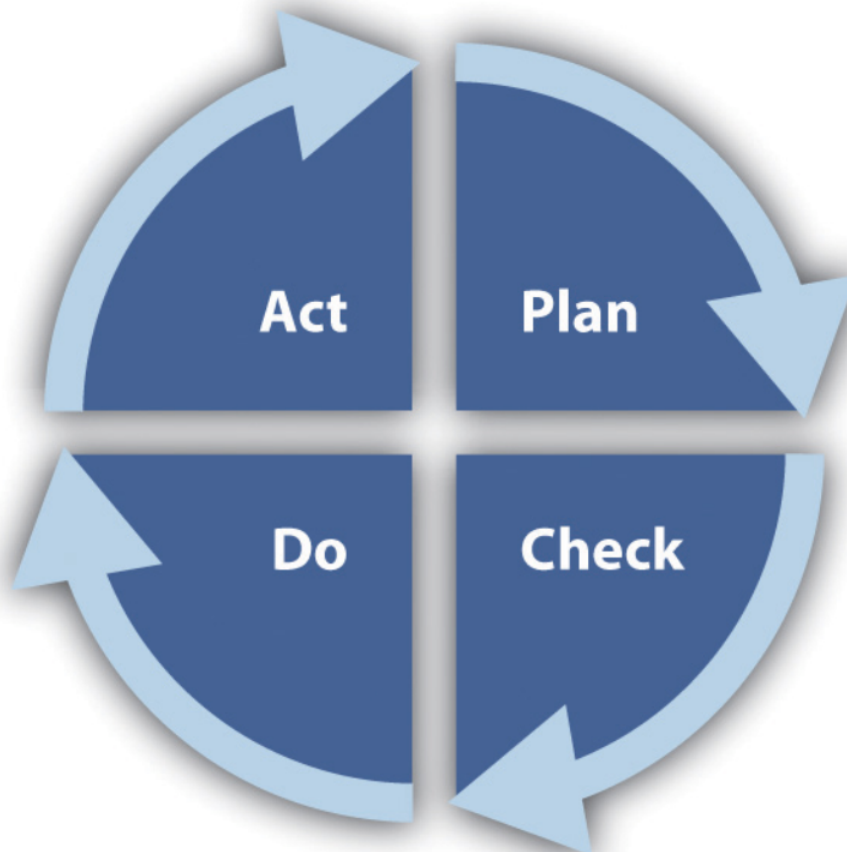
Dimension	Characteristics	Examples
<b>Empathy</b>	The extent and quality of individualized attention given to a customer.	Empathy should be thought of in terms of a doctor's "bedside manner." Customers want to be thought of as individuals, not as numbers. Businesses should avoid using preprinted labels on envelopes because this clearly conveys the image of a mass mailing.

When using the term *quality management*, we should recognize that there is no universally consistent notion of how one can produce quality products and services. In fact, the quality management movement has been evolving for nearly a century. Perhaps the best way of tracing this evolution is to examine the contributions of some of the key proponents of quality. One of the first bodies of work that should be reviewed is that of Walter A. Shewhart (1891–1967). Similar to two other “quality gurus”—W. Edwards Deming and Joseph Juran (the authors are hesitant to use the term *guru* because this might question the true value of the work of these individuals)—Shewhart worked for Western Electric Company, a division of AT&T. “Walter A. Shewhart,” ASQ, accessed February 4, 2012, [asq.org/about-asq/who-we-are/bio\\_shewhart.html](http://asq.org/about-asq/who-we-are/bio_shewhart.html). There he developed what is now known as **statistical process control (SPC)**, a mathematical approach that measures how well products conform to previously determined standards. The goal here is to develop a control chart that would enable an operator to distinguish between the random change associated with any manufacturing process and specifically assignable causes of such change. As an example, a machine produces 0.25-inch diameter bolts. Not all the manufactured bolts will be exactly 0.25 inches in diameter. There will be some natural variation around this value. Rather than test the diameter of every bolt, in SPC, a sample of bolts is tested on a regular basis. Based on statistical analysis, one can determine if this sample is within acceptable limits around the 0.25-inch value. If a sample is not within these acceptable limits, then the machine is shut down, and every effort is made to determine the assignable cause—faulty materials, machine error, or operator error. The benefit of this approach is that one can determine, with a high degree of accuracy, the operational characteristics of the system without the expense of testing every item produced. A full discussion of all aspects of SPC is beyond the focus of this text.

Shewhart’s two books, *Economic Control of Quality of Manufactured Product* Walter A. Shewhart, *Economic Control of Quality of Manufactured Product* (New York: D. Van Nostrand Company, 1931). and *Statistical Method from the Viewpoint of Quality Control*, Walter A. Shewhart, *Statistical Method from the Viewpoint of Quality Control* (Long Island, NY: Dover Publications, 1980). are still available in print and are viewed as the foundation works in the field.

Shewhart also made major contributions in the way we think about implementing a quality program in any organization. He advocated a systematic approach structured in four cyclical phases. This approach is sometimes referred to as the **PDCA cycle** (see Figure 13.3) or the Deming cycle. (Yet the Deming cycle is an improper name for the PDCA cycle.) The PDCA cycle calls for a cycle of continuous improvement. The first step is to *plan* for a change that would lead to improvement. The planning process requires data collection to make a decision. Regardless of the approach to quality management, all decision making must be data driven. The second step in the cycle is the *do* phase. This entails implementing the change. It also implies that a business will implement that change on an experimental basis, meaning that the organization would run a pilot program rather than implementing it throughout the entire organization. The third phase of the cycle is *check*. This means that after a sufficient period of time following the initial implementation phase, the results are evaluated to ascertain if the change produced the desired effect. If that answer is positive, then the organization moves onto the fourth stage of the cycle (*act*), where the changes are implemented throughout the entire organization. At the end of the *act* phase, the process is repeated with respect to some new problem area.

Figure 13.3 The PDCA Cycle



The two other quality gurus who worked with Shewhart at Western Electric Company, as previously mentioned, were Joseph Juran and W. Edwards Deming. Juran's numerous contributions to the field include the first standard reference work in the field of quality management: *The Quality Control Handbook*. "Joseph M. Juran," *Juran Institute Inc.*, accessed February 4, 2012, [www.juran.com/about\\_juran\\_institute\\_our\\_founder.html](http://www.juran.com/about_juran_institute_our_founder.html). He also developed the Juran Trilogy, an approach to quality management that involves three phases: quality control, quality improvement, and quality planning.

Deming was born in 1900 and received an engineering degree from the University of Wyoming and a doctorate from Yale University. During his career, he worked for Western Electric Company, Bell Labs, and the US Department of Agriculture. During the Second World War, he taught SPC methods to thousands of engineers and plant personnel. After the war, Deming worked in Japan with Douglas MacArthur's Office of Supreme Command of Allied Powers. Several years later, he returned to Japan and worked with Japanese scientists and engineers and taught them about SPC. Deming's work with the Japanese improved his understanding of what must transpire in a business organization to ensure quality products and services. Robert B. Austenfeld Jr., "W. Edwards Deming: The Story of a Truly Remarkable Person," *International Quality Federation*, May 10, 2011, accessed February 4, 2012, [www.iqfnet.org/Ff4203.pdf](http://www.iqfnet.org/Ff4203.pdf). The Japanese recognized his accomplishments by creating the Deming Prize, which is awarded to organizations that exemplify a commitment to quality.

Many consider Deming as the world's preeminent proponent of quality. In fact, many see him as one of the most important business thinkers of the twentieth century. In a November 1999 issue, *Fortune* identified Deming, along with Peter Drucker and Frederick Taylor, as three individuals who had more impact on the operations of businesses than any CEO. In its April 22, 1991, edition, *US News & World Report* covered nine important turning points in human history. The final point was Deming's impact on the Japanese quality movement. "History's Hidden Turning Points," *Leadership Alliance*, accessed March 2, 2012, [www.leadershipalliance.com/demingnews.htm](http://www.leadershipalliance.com/demingnews.htm).

What distinguishes Deming from all other quality theorists is his comprehensiveness known as **the Deming method**. It has been stated that Deming proposed an alternative philosophy of doing business. He argued that one should believe that the purpose of a business is to delight a customer. If customers are delighted, then profits will follow. The Deming philosophy was summarized in his fourteen points, which are given in Table 13.3.



Table 13.3 Deming's Fourteen Points

#	Point	Explanation
1	Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business, and to provide jobs.	Deming believed that a firm must have a strong future focus. It should be willing to innovate all areas of operations, services, and products with the purpose of improvement and corresponding cost reduction. It must be willing on all levels to invest in these activities.
2	Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.	Businesses can no longer accept given levels of errors, defects, and mistakes. This means that a small business must challenge its own beliefs about acceptable levels of failure.
3	Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.	Inspecting 100 percent of the finished goods produced by a business is wasteful, costly, and without purpose. A business should focus on evaluating every process that is used to produce the product or the service. Using SPC and sampling will achieve better results than 100 percent inspection at a far lower cost. See <a href="#">Section 13.4</a> .
4	End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on the long-term relationship of loyalty and trust.	Low price has no meaning if a customer is buying poor quality. It is better to find a business that can ensure the quality of the goods (or services) rather than attempting to play off several suppliers to achieve a lower price. In Chapter 11, this is a central tenet.
5	Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease cost.	The focus of a quality management program should be on processes rather than merely looking at outcomes. The goal is to consistently improve these processes. This will result in lower cost and better utilization of labor.
6	Institute training on the job.	A training program should recognize that people learn in different ways. The training program should be tailored to the learning style of the employees. The central focus of any training program throughout an organization should be to make employees aware of the problems associated with variation.

#	Point	Explanation
7	Institute leadership. The aim of supervision should be to help people and machines and gadgets to do a better job. Supervision of management is in need of an overhaul, as well as supervision of production workers.	Businesses have little trouble finding managers and supervisors; the problem is finding leaders. Leadership involves a deep and thorough understanding of the work that is to be done. Leaders provide the vision to employees that enable them to carry out their work with pride.
8	Drive out fear, so that everyone may work effectively for the company.	Fear is often systemic in organizations. It could be the fear of losing one's job. It can be the fear of making a mistake. It could be the fear of displeasing a supervisor. In all cases, this fear prevents employees from taking an initiative and being innovative. In the long run, this can be fatal for any organization.
9	Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.	If people in different functional areas of a business do not know what the others are doing, they cannot adopt the perspective that focuses on what is good for the business at large. They focus on only what is good for their silo. A failure to understand the duties and responsibilities of people in other segments of the business means that people engage in finger-pointing rather than aggressively attempting to solve problems on a system-wide basis.
10	Eliminate slogans, exhortations, and targets for the workforce asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the work force.	Exhorting people to work harder is pointless if there are fundamental flaws or problems with the system they are working in. People recognize this and resent it. It makes them doubt the sincerity and intelligence of management.
11	<ol style="list-style-type: none"> <li>1. Eliminate work standards (quotas) on the factory floor. Substitute leadership.</li> <li>2. Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.</li> </ol>	Work standards that do not include a quality component may be detrimental to the operation of a business. Refer to the example at the beginning of this chapter. The second student was superior on the measure of the number of schedules sorted per hour; however, the students who received the wrong schedule would take a dim view of the capability of the college. Deming feels that this holds true for not only production workers but also management. Using the wrong set of numbers that drive the business may drive the business into insolvency.



#	Point	Explanation
12	<ol style="list-style-type: none"> <li>1. Remove barriers that rob the hourly paid worker of his right to pride in workmanship. The responsibility of supervisors must be changed from sheer numbers to quality.</li> <li>2. Remove barriers that rob people in management and engineering of their right to pride in workmanship. This means, inter alia, abolishment of the annual or merit rating and management by objective.</li> </ol>	Employees who do not have a chance for some dignity associated with their work are unlikely to take pride in their work. Pride forces individuals to perform tasks correctly and spot errors. Pride should foster individual initiative to improve processes and quality.
13	Institute a vigorous program of education and self-improvement.	Training programs should be available for all levels of employees. Training should not be limited to short-term outcomes; it should focus on providing a deep understanding of the key processes of a business.
14	Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.	Quality should never be seen as the responsibility of management or a specialized group, such as quality assurance. It is everyone's job.

Source: W. Edwards Deming, *Out of Crisis* (Cambridge, MA: MIT Press, 1982), 23–24.

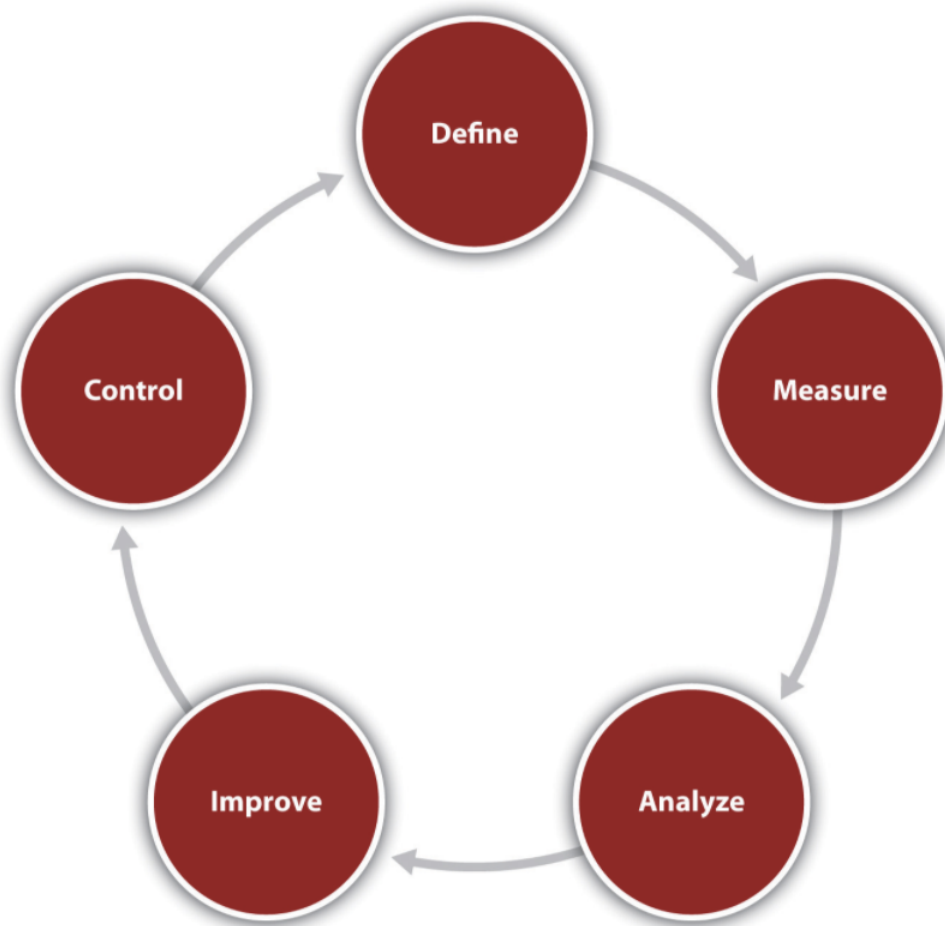
The last quality theorist who should be discussed is Philip Crosby. Crosby was an executive at ITT and the Martin Company. His approach to quality reflected a practicing manager's perspective. Although he is often associated (correctly) with the zero-defect program, his great contribution can be found in his first book *Quality Is Free*. Philip Crosby, *Quality Is Free* (New York: McGraw-Hill, 1979). In this text, Crosby argued that the definition of quality should be based on conformance to quality, and nonconformance is highly expensive. He estimates that the cost of nonconformance can run as high as 30 percent of revenue. Philip B. Crosby, "Quality Is Free—If You Understand It," *Philip Crosby Associates II Inc.*, accessed February 4, 2012, [www.wpppl.org/wphistory/philipcrosby/QualityIsFreeIfYouUnderstandIt.pdf](http://www.wpppl.org/wphistory/philipcrosby/QualityIsFreeIfYouUnderstandIt.pdf). This figure includes costs associated with rework, scrap, warranties, lost goodwill, reputation, and customers. He further argues that expenditures on quality to guarantee conformance to requirements will always be less than the cost of nonconformance; therefore, quality should be seen as being free. Crosby was embraced by many American executives because of his emphasis on the practical and his formal acknowledgment of the importance of the bottom line. His approach is often referred to as **Total Quality Management**.

Implementing quality management concepts in American business has had a long and somewhat checkered history. In the last four decades, total quality and continuous quality movements have blossomed in popularity and then quickly died. Two decades ago, Walter Lareau argued that many American businesses, particularly large businesses, have an almost pathological antipathy toward quality management because some of its (quality) fundamental principles run totally counter to corporate belief systems, namely, customers are a pain and employees are an even bigger pain. Walter Lareau, *American Samurai: Why Every American Executive Must Fight for Quality* (New York: Warner Books, 1991), 47. In the intervening time, however, it appears that one approach to quality has captured the imagination of many businesses—both large and small. This quality program is known as **Six Sigma**.

Although Six Sigma is often associated, at least in the public's mind, with General Electric, it began at Motorola in the 1980s and was spearheaded by William Smith. Wolf Akpose, "A History of Six Sigma," December 2010, accessed February 4, 2012, [www.todaysengineer.org/2010/Dec/six-sigma.asp](http://www.todaysengineer.org/2010/Dec/six-sigma.asp). The term *sigma* ( $\sigma$ ) comes from SPC and represents the concept of the **standard deviation**. Six standard deviations away from specifications signify that the process produces only 3.4 defects per million opportunities. This is a remarkable accomplishment. Imagine a restaurant that is open 12 hours a day, 365 days per year. On average, the restaurant serves 1 meal every 55 seconds or about 800 meals per day. It would take them approximately 3.4 years to serve one million meals. So if this restaurant was operating at a Six Sigma level, it would make a mistake in taking an order *only once a year*. Six Sigma draws on a battery of tools and techniques derived from SPC and earlier quality management programs. Six Sigma's mantra for continuous improvement involves what is referred to as the **DMAIC** cycle (see Figure 13.4), where D stands for

design, M stands for measurement, A stands for analyze, I stands for improve, and C stands for control. Clearly, this concept is derived from the Shewhart cycle.

Figure 13.4 The DMAIC Cycle



What was different about the Six Sigma program was that all these tools and techniques were packaged in a coherent program. There was a heavy emphasis on quick results and the ability to demonstrate to management tangible cost savings. Six Sigma involves committed training programs that promote statistical tools and management techniques. Graduates of the most basic certification training program are referred to as “green belts,” a term derived from the martial arts. Those who receive more advanced training are known as “black belts.” “Six Sigma Training, History, Definitions: Six Sigma and Quality Management Glossary,” *BusinessBalls.com*, accessed February 4, 2012, [www.businessballs.com/sixsigma.htm](http://www.businessballs.com/sixsigma.htm). Given that Six Sigma is closely associated with large corporate entities and complex training programs, one might think that it would be irrelevant for smaller enterprises. Nothing could be further from the truth. Six Sigma offers a systematic and pragmatic approach for quality improvement in the smaller firm. Greg Brue, “Six Sigma for Small Business,” *Entrepreneur Press*, 2006, accessed February 4, 2012, [www.entrepreneur.com/downloads/assist/six\\_sigma\\_for\\_smallbusiness.pdf](http://www.entrepreneur.com/downloads/assist/six_sigma_for_smallbusiness.pdf).

#### Video Clip 13.5

*Six Sigma—The Essence Of*

[\(click to see video\)](#)

*An overview of Six Sigma and a discussion of how organizations use it.*

#### Video Clip 13.6

*Pizza Anyone? Six Sigma DMAIC Strategy Introduction*

[\(click to see video\)](#)

*Explains Six Sigma's DMAIC strategy in simple, nontechnical terms using the familiar setting of a pizza restaurant business.*

### Video Clip 13.7

*Six Sigma Interview with Jack Welch*

(click to see video)

*Jack Welch, former CEO of General Electric, talks about implementing Six Sigma at General Electric.*

### Web Resources

PDCA Cycle

A description of the Shewhart cycle.

[asq.org/learn-about-quality/project-planning-tools/overview/pdca-cycle.html](http://asq.org/learn-about-quality/project-planning-tools/overview/pdca-cycle.html)

Deming's Fourteen Points

Discusses Deming's fourteen points and includes links to allied topics.

[leanandkanban.wordpress.com/2011/07/15/demings-14-points](http://leanandkanban.wordpress.com/2011/07/15/demings-14-points)

Seven Basic Quality Tools

These seven tools get to the heart of implementing quality principles.

[asq.org/learn-about-quality/seven-basic-quality-tools/overview/overview.html](http://asq.org/learn-about-quality/seven-basic-quality-tools/overview/overview.html)

Seven New Management and Planning Tools

Ways to promote innovation, communicate information, and successfully plan major projects.

[asq.org/learn-about-quality/quality-tools.html](http://asq.org/learn-about-quality/quality-tools.html)

### KEY TAKEAWAYS

- Quality for manufactured goods may be defined by using the eight dimensions of product quality.
- Quality in services may be defined by using the five dimensions of service quality.
- Quality should be seen as a continuing cycle (PDCA) of improvement.
- Quality guru W. Edwards Deming offers a complete philosophy of quality management in the workplace.
- The costs of quality improvements are always less than the costs of poor quality; hence quality is free.
- Six Sigma is a modern and highly practical approach to quality improvements.

### EXERCISES

1. Take the eight dimensions of product quality and rank them in terms of relative importance for the following products: a heart pacemaker, a minivan, a laptop computer for high school students, an army assault rifle, an office copy machine, a light bulb, a jet engine, and a pocket lighter.
2. Take the five dimensions of service quality and rank them in terms of relative importance for the following services: a bank, a college classroom, a walk-in clinic, a divorce lawyer's office, a cell phone service, a credit card company, a financial advisor, and a computer repair company.
3. Assume that your college or university suddenly decided to fully accept the Deming philosophy. How would it have to change? What do you think would be the first change that a student would notice? How would a particular course change if an instructor adopted the Deming philosophy?

---

This page titled [13.4: Organizational Efficiency](#) is shared under a [CC BY-NC-SA](#) license and was authored, remixed, and/or curated by [Anonymous](#).

- [13.4: Organizational Efficiency](#) by Anonymous is licensed [CC BY-NC-SA 3.0](#). Original source: <https://2012books.lardbucket.org/books/modern-management-of-small-businesses/>.