CHAPTER 1

Introduction to Total Quality in Organizations

Joseph Juran, one of the most respected leaders of quality in the 1900s, suggested that the twentieth century would be defined by historians as the century of productivity. He also stated that the twenty-first century should be designated the century of quality. “We’ve made dependence on the quality of our technology a part of life.”

In this chapter we will introduce you to the basic principles of total quality (TQ). Specifically, we will

➣ provide reasons why attention to quality should be a part of every organization’s culture and management systems;
➣ provide a brief history of the “quality revolution”;
➣ describe philosophies of Deming, Juran, and Crosby as a basis for TQ approaches;
➣ provide an overview of the key principles of TQ;
➣ compare and contrast quality-focused management with traditional management practices; and
➣ discuss relationships of total quality with organizational models in management theory.

THE IMPORTANCE OF QUALITY

Today, we generally do not hear much about quality in business, except when things go wrong. Here is one example:

Spend $25,000 on a car that doesn’t run the way you expect it to, and you get pretty angry. Spend $50,000 or $100,000, and you get really angry. Just listen to the anguished howls of Mercedes-Benz owners on Web sites . . . as they vent about the latest mishap to afflict their Benzes. Depending on the model, the complaints range from faulty key fobs and leaky sunroofs to balky electronics that leave drivers and their...
passengers stranded. Regardless of the severity, a single sentiment runs through the gripes: this shouldn’t be happening to a Mercedes.2

Quality was THE buzzword among businesses during the 1980s and into the 1990s. Nevertheless, Jeffrey E. Garten, dean of the Yale School of Management, observed just a few years ago: “Whatever happened to the hoopla surrounding quality control in Corporate America? Has the issue slipped from the front page because the war against big-time defects has been won? Or could Corporate America be deluding itself into thinking that quality no longer is the huge problem it once was?” Dean Garten points to the Firestone tire fiasco, recalls of circuit boards by Intel, automobile recalls, poor customer-service quality, the lack of a quality framework for e-business, and the need for higher quality standards in biotechnology as reminders that quality problems still abound.3 Although Mercedes’ longtime CEO noted, “Quality is part of our heritage, one of our core values,” without a continuous and relentless focus on it, it is easy for quality to slip by the wayside. Consumers today are intelligent enough to recognize quality issues that firms face today (see the box “You Can Fool Some of the People Some of the Time”), and the organization that doesn’t heed its customers is in for a rude awakening, or, at worst, a quick demise. This is why an understanding of quality is vital to every employee in every organization.

Stories of successful organizations generally end up in publications dedicated to quality professionals, which basically “preach to the choir.” Here are just a few highlights of the results achieved by companies that have

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**You Can Fool Some of the People Some of the Time . . .**

Letters to the editor of *Business Week* show that quality is an important concern to consumers, and that quality guides their purchasing decisions: “[Robert A.] Lutz and the other big hires will have to do more than spruce up GM’s designs in order to regain market share. The new Cadillac CTS and other model changes will have very little effect unless GM buckles down to improve the quality of its products. As a longtime GM customer . . . I have watched GM fall behind in product reliability and durability and just never quite get with it. Finally this year, I threw in the towel and reluctantly invested in a Lexus” (September 17, 2001, p. 16). “‘Can the Nordstroms find the right style?’ summarizes, in part, what my wife has been telling me for several years: The company has lost touch with its customer base. When a salesperson responded to an observation my wife made by telling her to write the company a letter—while telling her they had “100 letters on the same subject”—that tells you something” (September 10, 2001, p. 22).
embraced quality as a basic business principle but that have never made the pages of *Fortune* and *Business Week*.

1. Among associates at Clarke American, overall satisfaction improved from 72 percent in 1996 to 84 percent in 2000. Rising associate satisfaction correlates with the 84 percent increase in revenue earned per associate since 1995. Annual growth in company revenues increased from a rate of 4.2 percent in 1996 to 16 percent in 2000, compared to the industry’s average annual growth rate of less than 1 percent over the five-year period.

2. The Spicer Driveshaft Division of Dana Corporation lowered internal defect rates by more than 75 percent. Employee turnover is below 1 percent, and economic value added increased from $15 million to $35 million in two years.

3. Texas Nameplate Company increased its national market share from less than 3 percent in 1994 to 5 percent in 1997, reduced its defects from 3.65 percent to about 1 percent of billings, and increased on-time delivery from 95 to 98 percent.

4. Region Americas of STMicroelectronics, Inc., reduced lost-day injuries from 1.01 per 100 workers in 1996 to 0.65 in 1999, which is 74 percent below the industry average, and employee satisfaction levels in 1999 exceeded the industry composite in 8 of 10 categories.

5. Pal’s Sudden Service, a privately owned quick-service restaurant chain in eastern Tennessee, garnered customer quality scores averaging 95.8 percent in 2001, compared with 84.1 percent for its best competitor, and improved order delivery speed by more than 30 percent since 1995.


7. KARLEE, a contract manufacturer of precision sheet metal and machined components, reduced waste from 1.5 percent of sales to less than 0.5 percent of sales while nearly doubling productivity from 1995 to 2000.

8. SSM Health Care’s share of the St. Louis market increased substantially while three of its five competitors lost market share. They achieved a AA credit rating by Standard and Poor’s for four consecutive years, a rating attained by fewer than 1 percent of U.S. hospitals.

Many more statistics like these can be cited, and other empirical evidence exists that firms implementing effective total quality approaches improve their performance on measures of income, sales growth, cost control, and growth in employment and total assets. Nevertheless, scores of companies have either failed to take the first step in a quality journey, or have let initial successes fade away because of lack of commitment and sustainability.

**Total quality**—a comprehensive, organization-wide effort to improve the quality of products and services—applies to all organizations—large and small, manufacturing and service, profit and not-for-profit (see the box “Quality Starts with a Vision”).
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**A Brief History**

To understand the importance of quality in business today, we need to review some history. Before the Industrial Revolution, skilled craftspeople served both as manufacturers and inspectors, building quality into their products through their considerable pride in their workmanship. Customers expected quality, and craftspeople understood it.

The Industrial Revolution changed everything. Thomas Jefferson brought Honore Le Blanc’s concept of interchangeable parts to America. Eli Whitney mistakenly believed that this idea would be easy to carry out. The government awarded him a contract in 1798 to supply 10,000 muskets in two years.

**Quality Starts with a Vision**

Unless you live in Webster, New York, you probably have never heard of Trident Precision Manufacturing, Inc. The privately held company was formed in 1979 with three people, and today manufactures precision sheet metal components, electromechanical assemblies, and custom products, mostly in the office equipment, medical supply, computer, and defense industries with a workforce of about 170. In 1995, revenues totaled $14.5 million. Trident has established quality as its basic business plan to accomplish short- and long-term goals for five key business drivers: customer satisfaction, employee satisfaction, shareholder value, operational performance, and supplier partnerships.

Employee turnover declined dramatically, from 41 percent in 1988 to 5 percent in 1994 and 1995. Defect rates fell so much that Trident offered a full guarantee against defects in its custom products. On-time delivery performance increased from 87 percent in 1990 to 99.94 percent in 1995. Rates of return on assets consistently exceeded industry averages, customers rated the quality of their products at 99.8 percent or better, and the company never lost a customer to a competitor. In 1996, Trident received the Malcolm Baldrige National Quality Award, the highest level of recognition in the United States for organizations demonstrating outstanding business results and management approaches to achieving performance excellence.

How did Trident achieve such success? Trident’s total quality quest began in 1988, when CEO Nicholas Juskiw attended a symposium offered by Xerox Corporation about its Leadership Through Quality strategy. When Juskiw wrote his vision statement he said: My Vision for Trident is one in which each of us shares in the responsibility, growth, and benefits of becoming a world-class organization. How will we, as a team, achieve this? Through quality! Not just the quality of each individual part but through Total Quality—in everything we say and do. . . . As a strong team, with each headed in the same direction, we can become the unquestionable leader that our Customers, Industry, and Community look up to.
He designed special machine tools and trained unskilled workmen to make parts according to a standard design, measure them, and compare them to a model. Unfortunately, Whitney grossly underestimated the effect of variation in the production process and its impact on quality. It took more than 10 years to complete the project, perhaps the first example of cost-overrun in government contracts! This same obstacle—variation—continues to plague American managers to this day.

Frederick W. Taylor’s concept of “scientific management” greatly influenced the nature of quality in manufacturing organizations. By focusing on production efficiency and decomposing jobs into small work tasks, the modern assembly line destroyed the holistic nature of manufacturing. To ensure that products were manufactured correctly, independent “quality control” departments assumed the tasks of inspection. Thus, the separation of good from bad product became the chief means of ensuring quality.

Statistical approaches to quality control had their origins at Western Electric when the inspection department was transferred to Bell Telephone Laboratories in the 1920s. The pioneers of quality control—Walter Shewhart, Harold Dodge, George Edwards, and others—developed new theories and methods of inspection to improve and maintain quality. Control charts, sampling techniques, and economic analysis tools laid the foundation for modern quality assurance activity and influenced the thinking of two of their colleagues, W. Edwards Deming and Joseph M. Juran, both of whom also worked at Western Electric in the first half of the twentieth century.

Deming and Juran introduced statistical quality control to Japanese workers after World War II as part of General MacArthur’s rebuilding program. Although this was not much different than what was being done in America, there was one vital difference. They convinced top Japanese managers that quality improvement would open new world markets and was necessary for the survival of their nation. The managers believed in, and fully supported, the concept of quality improvement. The Japanese were in an ideal position to embrace this philosophy. Their country was devastated from the war, and they had few natural resources with which to compete, except their people. During the next 20 years, while the Japanese were improving quality at an unprecedented rate, quality levels in the West remained stagnant. Western manufacturers had little need to focus on quality. America had a virtual monopoly in manufacturing, and the postwar economy was hungry for nearly any kind of consumer good. Top managers focused their efforts on marketing, production quantity, and financial performance.

During the late 1970s and early 1980s, many businesses in the United States lost significant market share to other global competitors, Japan in particular. By 1987 Business Week posed a stern warning to American management:

Quality. Remember it? American manufacturing has slumped a long way from the glory days of the 1950s and ’60s when “Made in U.S.A.” proudly stood for the best that industry could turn out. . . . While the
Japanese were developing remarkably higher standards for a whole host of products, from consumer electronics to cars and machine tools, many U.S. managers were smugly dozing at the switch. Now, aside from aerospace and agriculture, there are few markets left where the U.S. carries its own weight in international trade. For American industry, the message is simple. Get better or get beat.6

The “quality revolution” in America can be traced to 1980, when NBC aired a white paper titled “If Japan Can . . . Why Can’t We?” This program introduced the 80-year-old Deming, who was virtually unknown in the United States, to corporate executives across America. Ford Motor Company was among the first to invite Deming to help transform its operations.

Within a few years, Ford’s earnings were the highest for any company in automotive history, despite a 7 percent drop in U.S. car and truck industry sales, higher capital spending, and increased marketing costs. In 1992 the media celebrated the fact that the Ford Taurus outsold the Honda Accord to become the leader in domestic sales. Former CEO Donald Petersen stated: “The work of Dr. Deming has definitely helped change Ford’s corporate leadership. . . . Dr. Deming has influenced my thinking in a variety of ways. What stands out is that he helped me crystallize my ideas concerning the value of teamwork, process improvement and the pervasive power of the concept of continuous improvement.” Ironically, by the turn of the new century, Ford’s quality dropped to last place among American car companies, demonstrating that sustaining quality efforts is indeed a difficult challenge.

America woke up to quality during the 1980s as most major companies embarked on extensive quality improvement campaigns. In 1984 the U.S. government designated October as National Quality Month. In 1987—some 34 years after Japan established the Deming Prize—Congress established the Malcolm Baldrige National Quality Award, spawning a remarkable interest in quality among American businesses. By the end of the decade Florida Power and Light became the first non-Japanese company to win Japan’s coveted Deming Prize for quality. After the publicity that quality received from the manufacturing sector, the quality movement shifted to services. Companies such as FedEx, The Ritz-Carlton Hotel Company, and AT&T Universal Card Services (now a part of CitiBank) demonstrated clearly that quality principles can be applied effectively in the service sector.

During the 1990s, health care, government, and education began to pay increased attention to quality. As more public and government attention focuses on the nation’s health care system, its providers turn toward quality as a means of achieving better performance and lower costs.7 One hospital, for example, lowered its rate of postsurgical infections to less than one fifth of the acceptable national norms through the use of quality tools. In 1993, Vice President Al Gore spearheaded the National Performance Review, an initiative driven by the need to improve quality, which made 384 recommendations and indicated 1,214 specific actions that the federal government
should take to improve operations and reduce costs. In 1991 a consortium of professional associations, business associations, and individual businesses and universities incorporated a nonprofit group called the National Education Quality Initiative to improve educational processes through quality principles. Many local school systems, colleges, and universities have made considerable progress.

Although quality initiatives focused initially on reducing defects and errors in products and services through the use of measurement, statistics, and other problem-solving tools, organizations began to recognize that lasting improvement could not be accomplished without significant attention to the quality of the management practices used on a daily basis. Managers began to realize that the approaches they use to listen to customers and develop long-term relationships, develop strategy, measure performance and analyze data, reward and train employees, design and deliver products and services, and act as leaders in their organizations are the true enablers of quality, customer satisfaction, and business results. In other words, they recognized that the “quality of management” is as important as the “management of quality.” Many began to use the term Big Q to contrast the difference between managing for quality in all organizational processes as opposed to focusing solely on manufacturing quality (Little Q). As organizations began to integrate quality principles into their management systems, the notion of total quality management, or TQM, became popular. Quality took on a new meaning of organization-wide performance excellence rather than a narrow engineering- or production-based technical discipline and permeated every aspect of running an organization.

Today, the term TQM has virtually disappeared from business vernacular; however, the underlying principles of quality management are recognized as the foundation of high-performance management systems and an important factor for competitive success. Perhaps it is unfortunate that a three-letter acronym was chosen to represent such a powerful management concept. It is equally unfortunate that people point to the demise of faddish terminology as a generalization of the concepts themselves. Many organizations have integrated quality principles so tightly with daily work activities that they no longer view quality as something special. In contrast, many other organizations have barely begun.

Reasons for failure of quality initiatives are rooted in organizational approaches and systems, many of which this book addresses. As a former editor of Quality Digest put it: “No, TQM isn’t dead. TQM failures just prove that bad management is still alive and kicking.” The most successful organizations have found that the fundamental principles of total quality are essential to effective management practice, and continue to represent a sound approach for achieving business success.

The real challenge today is to ensure that managers do not lose sight of the basic principles on which quality management and performance excellence are based. The global marketplace and domestic and international competition
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has made organizations around the world realize that their survival depends on high quality. Many countries, such as Korea and India, are mounting national efforts to increase quality awareness, including conferences, seminars, radio shows, school essay contests, and pamphlet distribution.

Spain and Brazil are encouraging the publication of quality books in their native language to make them more accessible. These trends will only increase the level of competition in the future. Even the tools used to achieve quality a decade ago are no longer sufficient to achieve the performance levels necessary to compete in today's world. Many organizations are embracing sophisticated, statistically based tools as part of popular “Six Sigma” initiatives, which we highlight in Chapter 2. These require increased levels of training and education for managers and frontline employees alike, as well as the development of technical staff. As Tom Engibous, president and chief executive officer of Texas Instruments, commented on the present and future importance of quality in 1997: “Quality will have to be everywhere, integrated into all aspects of a winning organization.”

THE CONCEPT OF QUALITY

People define quality in many ways. Some think of quality as superiority or excellence, others view it as a lack of manufacturing or service defects, still others think of quality as related to product features or price. A study that asked managers of 86 firms in the eastern United States to define quality produced several dozen different responses, including:

1. perfection
2. consistency
3. eliminating waste
4. speed of delivery
5. compliance with policies and procedures
6. providing a good, usable product
7. doing it right the first time
8. delighting or pleasing customers
9. total customer service and satisfaction.

Today most managers agree that the main reason to pursue quality is to satisfy customers. The American National Standards Institute (ANSI) and the American Society for Quality (ASQ) define quality as “the totality of features and characteristics of a product or service that bears on its ability to satisfy given needs.” The view of quality as the satisfaction of customer needs is often called fitness for use. In highly competitive markets, merely satisfying customer needs will not achieve success. To beat the competition, organizations often must exceed customer expectations. Thus, one of the most popular definitions of quality is meeting or exceeding customer expectations. This definition is reflected in the vision statement of Hollywood Casino Resort in Tunica,
Mississippi: “Hollywood Casino Resort/Tunica is a place where guests feel invited and welcome. We provide the highest levels of personalized service and products for our guests, who always enjoy a fun-filled experience. Everyone at Hollywood Casino does the right thing right the first time, and puts the needs and wants of our guests in the forefront of every decision we make.” Deer Valley Resort is another example of an organization dedicated to exceeding customer expectations (see box “At Deer Valley, Quality Is Not a Snow Job”).

Customer-driven quality is fundamental to high-performing organizations. The president and CEO of Fujitsu Network Transmission Systems, a U.S. subsidiary of Fujitsu, Ltd., stated, “Our customers are intelligent; they expect us to continuously evolve to meet their ever-changing needs. They can’t afford to have a thousand mediocre suppliers in today’s competitive environment. They want a few exceptional ones.”

Managers of manufacturing and service functions deal with different types of quality issues; the following sections provide a brief overview of these issues. Although the details of quality management differ between manufacturing and service industries, the customer-driven definition eliminates these artificial distinctions and provides a unifying perspective.

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**At Deer Valley, Quality Is Not a Snow Job**

Deer Valley Resort in Park City, Utah, is viewed by many as The Ritz-Carlton of ski resorts, providing exceptional services and a superior ski vacation experience.

The resort offers curbside ski valet service to take equipment from vehicles, parking lot attendants to ensure efficient parking, and a shuttle to transport guests from the lot to Snow Park Lodge. Guests walk to the slopes on heated pavers that prevent the pavement from freezing and assist in snow removal. The central gathering area by the base lifts is wide and level, allowing plenty of room to put on equipment and easy access to the lifts. At the end of the day, guests can store their skis without charge at each lodge. The resort limits the number of skiers on the mountain to reduce lines and congestion, and offers complimentary mountain tours for both expert and intermediate skiers. Everyone is committed to ensuring that each guest has a wonderful experience, from “mountain hosts” stationed at the top of the lifts to answer questions and provide directions, to the friendly workers at the cafeterias and restaurants, whose food is consistently rated number one by ski enthusiast magazines. “Our goal is to make each guest feel like a winner,” says Bob Wheaton, vice president and general manager. “We go the extra mile on the mountain, in our ski school, and throughout our food-service operation because we want our guests to know they come first.”
Quality in Manufacturing

Well-developed quality systems have existed in manufacturing for some time. However, these systems focused primarily on technical issues such as equipment reliability, inspection, defect measurement, and process control. The transition to a customer-driven organization has caused fundamental changes in manufacturing practices, changes that are particularly evident in areas such as product design, human resource management, and supplier relations. Product design activities, for example, now closely integrate marketing, engineering, and manufacturing operations. Human resource practices concentrate on empowering workers to collect and analyze data, make critical operations decisions, and take responsibility for continuous improvements, thereby moving the responsibility for quality from the quality control department onto the factory floor. Suppliers have become partners in product design and manufacturing efforts. Many of these efforts were stimulated by the automobile industry, which forced their network of suppliers to improve quality.

Manufactured products have several quality dimensions including the following:

1. **Performance**: a product’s primary operating characteristics.
2. **Features**: the “bells and whistles” of a product.
3. **Reliability**: the probability of a product’s surviving over a specified period of time under stated conditions of use.
4. **Conformance**: the degree to which physical and performance characteristics of a product match preestablished standards.
5. **Durability**: the amount of use one gets from a product before it physically deteriorates or until replacement is preferable.
6. **Serviceability**: the ability to repair a product quickly and easily.
7. **Aesthetics**: how a product looks, feels, sounds, tastes, or smells.
8. **Perceived quality**: subjective assessment resulting from image, advertising, or brand names.

Most of these dimensions revolve around the design of the product. In designing the initial Lexus automobile for instance, Toyota bought several competitors’ cars—including Mercedes, Jaguar, and BMW—and put them through grueling test track runs before taking them apart. The chief engineer decided that he could match Mercedes on performance and reliability, as well as on luxury and status features. He developed 11 performance goals. The final design had a drag coefficient smaller than any other luxury car (resulting in higher aerodynamic performance), a lighter weight, a more fuel-efficient engine, and a lower noise level. Sturdier materials were used for seat edges to maintain their appearance longer. The engine was designed with more torque than German models to give the car the quick start that Americans prefer. Ford’s director of North American interior design called the instrument cluster “a work of art.”
Quality control in manufacturing is usually based on conformance, specifically *conformance to specifications*. Specifications are targets and tolerances determined by designers of products and services. Targets are the ideal values for which production strives; tolerances are acceptable deviations from these ideal values. For example, a computer chip manufacturer might specify that the distance between pins on a computer chip should be $0.095 \pm 0.005$ inches. The value 0.095 is the target, and ± 0.005 is the tolerance. Thus, any pin distance between 0.090 and 0.100 would be acceptable. A lack of defects has constituted quality in manufacturing for many years. Many studies comparing domestic and foreign products focus on statistical measures of defects. However, the lack of defects alone will not satisfy or exceed customer expectations. Many top managers have stated that good quality of conformance is simply the “entry into the game.” A better way to achieve distinction and delight customers is through improved product design. Thus, manufacturers are turning their attention toward improved design for achieving their quality and business goals.

**Quality in Services**

Service can be defined as “any primary or complementary activity that does not directly produce a physical product—that is, the non-goods part of the transaction between buyer (customer) and seller (provider).” A service might be as simple as handling a complaint or as complex as approving a home mortgage. Service organizations include hotels; health, legal, engineering, and other professional services; educational institutions; financial services; retailers; transportation; and public utilities.

Today services account for nearly 80 percent of the U.S. workforce. The importance of quality in services cannot be underestimated, as statistics from a variety of studies reveal:

- The average company never hears from more than 90 percent of its unhappy customers. For every complaint it receives, the company has at least 25 customers with problems, about one fourth of which are serious.
- Of the customers who make a complaint, more than half will do business again with that organization if their complaint is resolved. If the customer feels that the complaint was resolved quickly, this figure jumps to about 95 percent.
- The average customer who has had a problem will tell nine or ten others about it. Customers who have had complaints resolved satisfactorily will only tell about five others.
- It costs six times more to get a new customer than to keep a current customer.

So why do many companies treat customers as commodities? In Japan the notion of customer is equated with “honored guest.” Service clearly should be at the forefront of a firm’s priorities.
The service sector began to recognize the importance of quality several years after manufacturing had done so. This can be attributed to the fact that service industries had not confronted the same aggressive foreign competition that faced manufacturing. Another factor is the high turnover rate in service industry jobs, which typically pay less than manufacturing jobs. Constantly changing personnel makes establishing a culture for continuous improvement more difficult.

The production of services differs from manufacturing in many ways, and these differences have important implications for managing quality. The most critical differences are:

1. Customer needs and performance standards are often difficult to identify and measure, primarily because the customers define what they are, and each customer is different.
2. The production of services typically requires a higher degree of customization than does manufacturing. Doctors, lawyers, insurance salespeople, and food-service employees must tailor their services to individual customers. In manufacturing, the goal is uniformity.
3. The output of many service systems is intangible, whereas manufacturing produces tangible, visible products. Manufacturing quality can be assessed against firm design specifications, but service quality can only be assessed against customers’ subjective, nebulous expectations and past experiences. Manufactured goods can be recalled or replaced by the manufacturer, but poor service can only be followed up by apologies and reparations.
4. Services are produced and consumed simultaneously, whereas manufactured goods are produced prior to consumption. In addition, many services must be performed at the convenience of the customer. Therefore, services cannot be stored, inventoried, or inspected prior to delivery as manufactured goods are. Much more attention therefore must be paid to training and building quality into the service as a means of quality assurance.
5. Customers often are involved in the service process and present while it is being performed, whereas manufacturing is performed away from the customer. For example, customers of a quick-service restaurant place their own orders, carry their food to the table, and are expected to clear the table when they have finished eating.
6. Services are generally labor intensive, whereas manufacturing is more capital intensive. The quality of human interaction is a vital factor for services that involve human contact. For example, the quality of hospital care depends heavily on interactions among the patients, nurses, doctors, and other medical staff. Hence, the behavior and morale of service employees is critical in delivering a quality service experience.
7. Many service organizations must handle very large numbers of customer transactions. For example, on a given business day, the Royal Bank of Canada might process more than 5.5 million transactions for 7.5 million
customers through 1,600 branches and more than 3,500 banking machines, and FedEx might handle more than 1.5 million shipments across the globe. Such large volumes increase the opportunity for error.

These differences made it difficult for many service organizations to fully understand and apply total quality principles when it was the rage in manufacturing, although many have caught up admirably.

Many service organizations have well-developed quality assurance systems. Many of them, however, are based on manufacturing analogies and tend to be more product-oriented than service-oriented. Many of the key dimensions of product quality apply to services. For instance, “on time arrival” for an airline is a measure of service performance; frequent flyer awards and “business class” sections represent features. A typical hotel’s quality assurance system focuses on technical specifications such as properly made-up rooms (see the box, “Knock Three Times”). However, service organizations have special requirements that manufacturing systems cannot fulfill. The most important dimensions of service quality include the following:

- **Time:** How much time must a customer wait?
- **Timeliness:** Will a service be performed when promised?
- **Completeness:** Are all items in the order included?
- **Courtesy:** Do frontline employees greet each customer cheerfully?
- **Consistency:** Are services delivered in the same fashion for every customer, and every time for the same customer?
- **Accessibility and convenience:** Is the service easy to obtain?

**Knock Three Times**

Marriott has become infamous for its obsessively detailed standard operating procedures (SOPs), which result in hotels that travelers either love for their consistent good quality or hate for their bland uniformity. “This is a company that has more controls, more systems, and more procedural manuals than anyone—except the government,” says one industry veteran. “And they actually comply with them.” Housekeepers work with a 114-point checklist. One SOP: Server knocks three times. After knocking, the associate should immediately identify themselves in a clear voice, saying, “Room Service!” The guest’s name is never mentioned outside the door.

Although people love to make fun of such procedures, they are a serious part of Marriott’s business, and SOPs are designed to protect the brand. Recently, Marriott has removed some of the rigid guidelines for owners of hotels it manages, empowering them to make some of their own decisions on details.
• **Accuracy:** Is the service performed right the first time?
• **Responsiveness:** Can service personnel react quickly and resolve unexpected problems?

Service organizations must look beyond product orientation and pay significant attention to customer transactions and employee behavior. Several points that service organizations should consider are as follows:

• The quality characteristics that a firm should control may not be the obvious ones. Customer perceptions are critical, although it may be difficult to define what the customer wants. For example, speed of service is an important quality characteristic, yet perceptions of speed may differ significantly among different service organizations and customers. Marketing and consumer research can play a significant role.

• Behavior is a quality characteristic. The quality of human interaction is vital in every transaction that involves human contact. For example, banks have found that the friendliness of tellers is a principal factor in retaining depositors.

• Image is a major factor in shaping customer expectations of a service and in setting standards by which customers evaluate that service. A breakdown in image can be as harmful as a breakdown in delivery of the service itself. Top management is responsible for shaping and guiding the image that the firm projects.

• Establishing and measuring service levels may be difficult. Service standards, particularly those relating to human behavior, are often set judgmentally and are hard to measure. In manufacturing, it is easy to quantify output, scrap, and rework. Customer attitudes and employee competence are not as easily measured.

• Quality control activity may be required at times or in places where supervision and control personnel are not present. Often work must be performed at the convenience of the customer. This calls for more training of employees and self-management.

These issues suggest that the approach to managing quality in services differs from that used in manufacturing. However, manufacturing can be seen as a set of interrelated services, not only between the company and the ultimate consumer but also within the organization. Manufacturing is a customer of product design; assembly is a customer of manufacturing; sales is a customer of packaging and distribution. If quality is meeting and exceeding customer expectations, then manufacturing takes on a new meaning, far beyond product orientation. Total quality provides the umbrella under which everyone in the organization can strive to create customer satisfaction.

**Quality and E-Commerce**

Without a doubt, e-commerce has transformed our lives dramatically over the past decade. Customers can research information, shop for almost any
product; configure, price, and order computer systems; and take virtual test drives of automobiles and select from thousands of possible combinations of options on the Internet in the convenience of their homes. However, as many businesses found out, just setting up a Web site will not guarantee instant success. Several perceptive writers observed quality issues associated with e-commerce shortly before the dot-com crash in 2001. They noted that two out of three online shoppers abandoned their transactions after placing items in their shopping cart, and that 27 percent of people in the United States who tried e-banking stopped because the services were too complicated or time-consuming, whereas another 25 percent stopped because they were unhappy with customer service. Without a good understanding of customer needs and how to create simple, bulletproof processes to meet those needs, many virtual businesses failed. E-commerce is about providing quality information, goods, and services rapidly and accurately.

One consultant identified a simple set of quality characteristics on which e-tailers should focus by analyzing customer behavior of various Web sites and through customer satisfaction surveys. He concluded that customers return to e-commerce sites because of:

- Valuable content that is intuitive and understandable, accurate, and current. This means that the design of the site must meet the customers’ requirements, not the company’s. If customers misinterpret information and make a wrong purchase, expect returned products and nonreturning customers. Product offerings and price data change quickly, and need to be kept accurate and current. One of the author’s unfortunate experiences involved purchasing an accessory listed as compatible with a PDA only to find out that it didn’t work, leading to wasted time getting a return authorization, repackaging, and returning the product (the Web site was corrected a few weeks later).
- Speed and reliability as reflected by page loading rates, and the number of clicks required to navigate through the site, and server uptime.
- Ease of use and the ability to meet expectations, meaning no confusion in navigating the site and finding the required information, eliminating the need to input duplicate data, and providing any needed assistance.

These lessons were difficult to grasp initially, but many dot-coms have done it successfully. In fact, they have exploited information technology to develop and enhance customer relationships far beyond what traditional service organizations typically do. Amazon.com, from which many readers have probably ordered, has been extremely successful at this. They provide extensive information about products, such as reader reviews to help customers evaluate books, search used bookstores for out-of-print books, and even provide e-mail thank you letters a month or so after purchase.

However, although information technology reduces labor intensity and increases the speed of service, it can have adverse effects on other dimensions...
of quality. Some people, including some customers, will argue that customer satisfaction is decreased when less personal interaction takes place. However, consumers accustomed to the speed, efficiency, and superior customer service of e-commerce are demanding the same in retail transactions, simply adding more pressure to improve quality.

**EVOLUTION OF TOTAL QUALITY PRINCIPLES**

W. Edwards Deming, Joseph M. Juran, and Philip B. Crosby are regarded as true “management gurus” in the quality revolution. Their insights on measuring, managing, and improving quality have greatly influenced the practices that organizations use today. In this section we review their thinking as the foundation for modern concepts of TQ.

**The Deming Philosophy**

Deming was trained as a statistician and worked for Western Electric during its pioneering era of statistical quality control development in the 1920s and 1930s. During World War II he taught quality control courses as part of the national defense effort. Although Deming taught many engineers in the United States, he was not able to reach upper management. After the war, Deming was invited to Japan to teach statistical quality control concepts. Top managers there were eager to learn, and he addressed 21 top executives who collectively represented 80 percent of the country’s capital. They embraced Deming’s message and transformed their industries. By the mid-1970s, the quality of Japanese products exceeded that of Western manufacturers, and Japanese companies had made significant penetration into Western markets. Deming received Japan’s highest honor, the Royal Order of the Sacred Treasure. The former chairman of NEC Electronics once said, “There is not a day I don’t think about what Dr. Deming meant to us.”

Deming was virtually unknown in the United States until 1980 when NBC aired a white paper entitled “If Japan Can . . . Why Can’t We?”. This program made Deming a household name among corporate executives, and companies such as Ford invited him to assist them in revolutionizing their quality approaches. Deming worked with passion until his death in December 1993 at the age of 93, knowing he had little time left to make a difference in his home country. When asked how he would like to be remembered, Deming replied, “I probably won’t even be remembered.” Then after a long pause, he added, “Well, maybe . . . as someone who spent his life trying to keep America from committing suicide.”

Unlike other management gurus and consultants, Deming never defined or described quality precisely. In his last book, he stated, “A product or a service possesses quality if it helps somebody and enjoys a good and sustainable market.” Deming stressed that higher quality leads to higher productivity,
which in turn leads to long-term competitive strength. The Deming “chain
reaction,” shown in Figure 1.1, summarizes this view.

The Deming philosophy of quality and management is complex; indeed,
several books have been written in an effort to explain and interpret it.
Deming summarized his philosophy in what he called “A System of
Profound Knowledge,” which consists of four parts: (1) appreciation for a
system, (2) understanding process variation, (3) theory of knowledge, and
(4) psychology.

**Systems**

A *system* is a set of functions or activities within an organization that work
together to achieve organizational goals. A system must have an aim, a pur-
pose to which it continually strives. Deming believed that the aim of any sys-
tem is for everybody—stockholders, employees, customers, community, the
environment—to gain over the long term. Stockholders can realize financial
benefits, employees can have opportunities for training and education, cus-
tomers can receive products and services that meet their needs and create
satisfaction, the community can benefit from business leadership, and the
environment can benefit from socially responsible management.

For example, a McDonald’s restaurant can be viewed as a system. It con-
sists of the order-taker/cashier subsystem, grill and food preparation sub-
system, drive-through subsystem, and so on. The components of any system
must work together for the system to be effective. If the order taker places
the wrong order or the grill breaks down, customers will not get what they

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**Figure 1.1** THE DEMING CHAIN REACTION

1. Improve quality
2. Costs decrease because of less rework, fewer mistakes, fewer delays and snags, and better use of time and materials
3. Productivity improves
4. Capture the market with better quality and lower price
5. Stay in business
6. Provide jobs and more jobs
To run any system, managers must understand the interrelationships among all subsystems and the people that work in them (would a McDonald’s operate successfully without a store manager?).

Deming emphasized that management’s job is to optimize the system. By making decisions that are best for only a small part of the system (often encouraged by competition), we suboptimize. Suboptimization will prevent a system from achieving its goal. For example, a common practice is to purchase materials or services at the lowest bid. Inexpensive materials may be of such inferior quality that they will cause excessive costs in adjustment and repair during manufacture and assembly. Although the purchasing department’s track record might look good, the overall system will suffer.

This concept applies to managing people also. Pitting individuals or departments against each other for resources is self-destructive. The individuals or departments will perform to maximize their expected gain, not that of the firm as a whole. Systems require cooperation.

Variation

Just as no two snowflakes are exactly alike, no two outputs from any production process are exactly alike. A production process contains many sources of variation. Different lots of material will vary in strength, thickness, or moisture content, for example. Cutting tools will have inherent variation in strength and composition. During manufacturing, tools will experience wear, machine vibrations will cause changes in settings, and electrical fluctuations will cause variations in power. Operators may not position parts on fixtures consistently. The complex interaction of all these variations in materials, tools, machines, operators, and the environment cannot be understood. Variation due to any individual source appears random; however, their combined effect is stable and can usually be predicted statistically. Factors that are present as a natural part of a process are called common causes of variation.

Common causes generally account for about 80 to 90 percent of the observed variation in a production process. The remaining 10 to 20 percent result from special causes of variation, often called assignable causes. Special causes arise from external sources that are not inherent in the process. A bad batch of material purchased from a supplier, a poorly trained operator, excessive tool wear, or miscalibration of measuring instruments are examples of special causes. Special causes result in unnatural variations that disrupt the random pattern of common causes. Hence, they are generally easy to detect using statistical methods, and it is usually economical to remove them.

A system governed only by common causes is stable and its performance can be predicted. Special causes disrupt the predictable pattern. (Think of your commute to work or school—what happens when a snowstorm or accident occurs?) Unfortunately, managers either overreact to common cause variation or ignore special causes when they do occur. If they try to “fix” a common cause, they will actually increase the variation in the system. If they ignore special causes, they miss the opportunity to improve.
In Deming’s view, variation is the chief culprit of poor quality. In mechanical assemblies, for example, variations from specifications for part dimensions lead to inconsistent performance and premature wear and failure. Likewise, inconsistencies in service frustrate customers and damage a firm’s image.

Variation also increases the cost of doing business. An example was published in the Japanese newspaper *Asahi* comparing the cost and quality of Sony televisions at plants in Japan and San Diego. The color density of all the units produced at the San Diego plant was within specifications, although the density of some of those shipped from the Japanese plant was not (see Figure 1.2). However, the average loss per unit at the San Diego plant was $0.89 greater than that of the Japanese plant. This was because units out of specification at the San Diego plant were adjusted within the plant, adding cost to the process. Furthermore, a unit adjusted to just within specifications was more likely to generate customer complaints than a unit that was closer to the original target value, therefore incurring higher field service costs. Figure 1.2 shows that fewer U.S.-produced sets met the target value for color density. The distribution of quality in the Japanese plant was more uniform around the target value, and even though some units were out of specification, the total cost was less.

By minimizing variation, everyone benefits. The producer benefits by having less need for inspection, less scrap and rework, and higher productivity. The consumer is assured that all products have similar quality characteristics; this is especially important when the consumer is another firm using large quantities of the product in its own manufacturing or service operations. The only way to reduce common cause variation is to change the technology of the process—the machines, people, materials, methods, or measurement system. Only management can make these decisions; pressuring workers to perform at higher quality levels will only result in frustration. However, special cause variation can be identified by workers through the use of control charts, which are introduced in Chapter 7. This requires training and management support.

**Figure 1.2** Variation in U.S.-Made versus Japanese-Made Television Components
Theory of Knowledge
The third part of Profound Knowledge is called the “theory of knowledge,” which is a branch of philosophy concerned with the nature and scope of knowledge, its presuppositions and bases, and the general reliability of claims to knowledge. Deming was influenced greatly by Clarence Irving Lewis, author of *Mind and the World*.24 Lewis stated, “There is no knowledge without interpretation. If interpretation, which represents an activity of the mind, is always subject to the check of further experience, how is knowledge possible at all? . . . An argument from past to future at best is probable only, and even this probability must rest upon principles which are themselves more than probable.”

What this basically means is that management decisions should be driven by facts, data, and justifiable theories, not solely by opinions. Experience cannot be tested or validated, but good theories supported by data can establish a cause-and-effect relationship that can be used for prediction. Theory explains why things happen. For example, many companies have jumped on the latest fads advocated by popular business consultants, only to find that they result in failure. This often happens because they simply did not understand the context and assumptions required to make them work successfully.

Psychology
People design products and processes, serve customers, and achieve results. Psychology helps us to understand people, interactions between people and circumstances, interactions between leaders and employees, and the drivers of behavior. No leader can manage well without understanding these factors and incorporating them in key decisions. More important, people inherit the right to enjoy work. Psychology helps us to nurture and preserve people’s positive innate attributes.

Little in Deming’s system of Profound Knowledge is original. The concept of common and special causes of variation was developed by Walter Shewhart in the 1920s; behavioral theories to which Deming subscribes were developed in the 1960s; systems theory was refined by management scientists from the 1950s through the 1970s; and scientists in all fields have long understood the relationships among prediction, observation, and theory. Deming’s contribution was in tying together some basic concepts. He recognized the synergy among these diverse subjects and developed them into a theory of management.

Peter Scholtes, a noted consultant, makes some salient observations about the failure to understand the components of Profound Knowledge:25

1. When people don’t understand systems:
   - they see events as individual incidents rather than the net result of many interactions and interdependent forces;
   - they see the symptoms but not the deep causes of problems;
• they don’t understand how an intervention in one part of [an organization] can cause havoc in another place or at another time;
• they blame individuals for problems even when those individuals have little or no ability to control the events around them; and
• they don’t understand the ancient African saying, “It takes a whole village to raise a child.”

2. When people don’t understand variation:
• they don’t see trends that are occurring;
• they see trends where there are none;
• they don’t know when expectations are realistic;
• they don’t understand past performance so they can’t predict future performance;
• they don’t know the difference between prediction, forecasting, and guesswork;
• they give others credit or blame when those people are simply either lucky or unlucky. This usually occurs because people tend to attribute everything to human effort, heroics, frailty, error, or deliberate sabotage, no matter what the systemic cause; and they are less likely to distinguish between fact and opinion.

3. When people don’t understand psychology:
• they don’t understand motivation or why people do what they do;
• they resort to carrots and sticks and other forms of induced motivation that have no positive effect and impair the relationship between the motivator and the one being motivated;
• they don’t understand the process of change and the resistance to it;
• they revert to coercive and paternalistic approaches when dealing with people; and
• they create cynicism, demoralization, demotivation, guilt, resentment, burnout, craziness, and turnover.

4. When people don’t understand the theory of knowledge:
• they don’t know how to plan and accomplish learning and improvement;
• they don’t understand the difference between improvement and change; and
• problems will remain unsolved, despite their best efforts.

Deming espoused a transformation in management with his “14 Points for Management,” listed in Table 1.1. It is important to realize that the 14 Points date back several decades to when many organizations were ruled by autocratic managers who were driven by short-term profits and who had little regard for engaging the workforce or interest in quality improvement. Although management practices today are vastly different from when Deming first began to preach his philosophy, the 14 Points still convey important insights for managers. Failure to heed them might only lead to repeating the mistakes of the past.
TABLE 1.1 DEMING’S 14 POINTS FOR MANAGEMENT

1. Create and publish to all employees a statement of the aims and purposes of the company or other organization. The management must demonstrate constantly their commitment to this statement.
2. Learn the new philosophy, top management and everybody.
3. Understand the purpose of inspection, for improvement of processes and reduction of cost.
4. End the practice of awarding business on the basis of price tag alone.
5. Improve constantly and forever the system of production and service.
6. Institute training.
7. Teach and institute leadership.
8. Drive out fear. Create trust. Create a climate for innovation.
9. Optimize toward the aims and purposes of the company the efforts of teams, groups, staff areas.
10. Eliminate exhortations for the workforce.
11. (a) Eliminate numerical quotas for production. Instead, learn and institute methods for improvement.
    (b) Eliminate MBO (Management by Objective). Instead, learn the capabilities of processes and how to improve them.
12. Remove barriers that rob people of pride of workmanship.
14. Take action to accomplish the transformation.

1. Management Commitment—Making a commitment to drive improvement within an organization is still difficult for managers. Even when managers have conducted a thorough assessment of their organization and know what they need to change, many do not effectively follow up on opportunities. Reasons range from denial (“We can’t be that bad!”) to excuses (“We have a lot of irons on the fire right now.”). Effective leadership begins with commitment, and we will revisit this issue in Part IV of this book.

2. Learn the New Philosophy—Deming recognized that historical methods of management built on early twentieth-century principles of Frederick Taylor, such as quota-driven production, work measurement, and adversarial work relationships, simply don’t work. Although leadership begins with commitment, it also requires new ways of thinking. Today, many companies have adopted the principles of total quality that we will study as an essential part of their business strategy (see Chapter 3). However, people change jobs and organizations generally have a short memory—both need to continually renew themselves to learn new approaches and relearn many older ones. Today’s “new philosophies” include the Baldrige framework and Six Sigma, which will be studied in Chapter 2.
3. **Understand Inspection**—In the mid-twentieth century, inspection had been the principal means for quality control; companies employed dozens or even hundreds of people who inspected for quality on a full-time basis and added little value to the product. Deming suggested that inspection should be used judiciously as an information-gathering tool for improvement. Today, this new role of inspection has been integrated into the quality management practices of most companies. However, few managers truly know how variation affects their processes and inspection practices. Through better understanding, managers can eliminate unnecessary inspection, thus reducing non-value-added costs, or perform critical inspection tasks that avoid more expensive downstream repairs.

4. **End Price Tag Decisions**—Purchasing decisions traditionally have been driven by cost through competitive bidding, not by quality. Costs due to inferior materials and components increase costs in later stages of production and can far exceed the “savings” realized through competitive bidding. Deming promoted the recognition of purchasing departments as “internal suppliers” to production, and urged businesses to establish long-term relationships with a few suppliers, leading to loyalty and enhanced opportunities for improvement. Today’s emphasis on supply chain management (SCM) reflects the achievement of Point 4. SCM focuses heavily on a system’s view of the supply chain with the objective of minimizing total supply chain costs and developing stronger partnerships with suppliers. These ideas will be addressed in Chapter 4.

5. **Improve Constantly**—Traditionally, continuous improvement was not a common business practice; today it is recognized as a necessary means for survival in a highly competitive and global business environment. Improvements are necessary in both design and operations. Improved design of goods and services comes from understanding customer needs and continual market surveys and other sources of feedback, and from understanding the manufacturing and service delivery process. Improvements in operations are achieved by reducing the causes and impacts of variation, and engaging all employees to innovate and seek ways of doing their jobs more efficiently and effectively. The tools for improvement are constantly evolving, and organizations need to ensure that their employees understand and apply them effectively, which requires training, the focus of the next Point. Improvement will be studied further in Chapters 6 and 7.

6. **Institute Training**—People are an organization’s most valuable resource; they want to do a good job, but they often do not know how. Not only does training result in improvements in product and service quality and organizational performance, but it adds to worker morale, and demonstrates to workers that the company is dedicated to helping them and investing in their future. Training must transcend such basic job skills as running a machine or following the script when talking to customers.
Training should include tools for identifying, diagnosing, analyzing, and solving quality and performance problems. Today, many companies have excellent training programs for technology related to direct production but still fail to enrich the ancillary skills of their workforce. Here is where some of the most lucrative opportunities exist to make an impact on key business results.

7. *Institute Leadership*—The job of management is leadership and guidance, not supervision and work direction. Supervisors should be coaches, not policemen, and supervision should provide the link between management and the workforce. Leadership can help to eliminate fear and encourage teamwork. Leadership was, is, and will continue to be a challenging issue in every organization, particularly as new generations of managers replace those who have learned to lead. Thus, this Point of Deming’s will always be relevant to organizations.

8. *Drive Out Fear*—Fear in work manifests in many ways: fear of reprisal, fear of failure, fear of the unknown, fear of change. Fear encourages short-term, selfish thinking, not long-term improvement for the benefit of all. Fear is a cultural issue for all organizations. Creating a culture without fear is a slow process but can be destroyed in an instant with a transition of leadership and a change in corporate policies. Therefore, today’s managers need to continue to be sensitive to the impact that fear can have on their organizations. Positive motivation will be studied in Chapter 9.

9. *Optimize Team Efforts*—Barriers between individuals and departments lead to poor quality, because “customers” do not receive what they need from their “suppliers.” This is often the result of internal competition for raises or performance ratings. Teamwork helps to break down barriers between internal customers and suppliers. The focus should be on meeting customer needs and improving processes. Teamwork is an important means of achieving a company’s goals, and we discuss this further in Chapter 8.

10. *Eliminate Exhortations*—Motivation can be better achieved through trust and leadership than slogans. Slogans calling for improved quality usually assume that poor quality results from a lack of motivation. Workers cannot improve solely through motivational methods when the system in which they work constrains their performance. On the contrary, they will become frustrated and their performance will decrease further. Improvement stems from better organizational design and use of data-driven processes (see Chapters 5 through 7).

11. *Eliminate Quotas and MBO (Management by Objective)*—Numerical quotas encourage short-term rather than long-term behavior, particularly if rewards or performance appraisals are tied to meeting quotas. Deming acknowledged that goals are useful, but numerical goals set for others without incorporating a method to reach the goal generate frustration and resentment. Furthermore, variation in the system year-to-year or
quarter-to-quarter—a 5 percent increase or a 6 percent decrease, for example—makes comparisons meaningless. Management must understand the reasons for variation or poor performance and provide the means to improve, rather than focus on short-term goals.

12. **Remove Barriers to Pride in Workmanship**—Some organizations view workers as a “commodity.” Factory workers are given monotonous tasks; provided with inferior machines, tools, or materials; told to run defective items to meet sales pressures; and report to supervisors who know nothing about the job. This attitude has given way to increased levels of empowerment, providing workers with a sense of ownership of their work processes and higher self-esteem. This will be explored further in Chapter 9.

13. **Institute Education**—“Training” in Point 6 refers to job skills; education refers to self-development. Firms have a responsibility to develop the value and self-worth of the individual. Investing in people is a powerful motivation method. Today, many companies understand that elevating the general knowledge base of their workforce—outside of specific job skills—returns many benefits. However, others still view this task as a cost that can be easily cut when financial tradeoffs must be made.

14. **Take Action**—Any cultural change begins with top management and includes everyone. Changing an organizational culture generally meets with skepticism and resistance that many firms find difficult to deal with, particularly when many of the traditional management practices Deming felt must be eliminated are deeply ingrained in the organization’s culture. We address this further in Chapter 11.

Deming’s principles continue to live in many organizations today (see the box on Louisville Slugger).

**The Juran Philosophy**

Joseph M. Juran joined Western Electric in the 1920s during its pioneering days in the development of statistical methods for quality. He spent much of his time as a corporate industrial engineer. In 1951 Juran wrote, edited, and published one of the most comprehensive books on quality, the *Quality Control Handbook*, which has been revised many times. Juran taught quality principles to the Japanese in the 1950s just after Deming and was a principal force in their quality reorganization.

Juran took a more pragmatic approach to change than Deming, advocating approaches that are designed to fit into a company’s current strategic business planning with minimal risk of rejection. Juran views the pursuit of quality on two levels: (1) the mission of the firm as a whole is to achieve high product quality; and (2) the mission of each individual department in the firm is to achieve high production quality. Senior management must play an active and enthusiastic leadership role in the quality management process.
Hillerich & Bradsby Co. (H&B) has been making the Louisville Slugger brand of baseball bat for more than 115 years. In the mid-1980s, the company faced significant challenges from market changes and competition. CEO Jack Hillerich attended a four-day Deming seminar, which provided the basis for the company’s current quality efforts. Returning from the seminar, Hillerich decided to see what changes that Deming advocated were possible in an old company with an old union and a history of labor-management problems. Hillerich persuaded union officials to attend another Deming seminar with five senior managers.

Following the seminar, a core group of union and management people developed a strategy to change the company. They talked about building trust and changing the system “to make it something you want to work in.” Employees were interested, but skeptical. To demonstrate their commitment, managers examined Deming’s 14 Points, and picked several they believed they could make progress on through actions that would demonstrate a serious intention to change. One of the first changes was the elimination of work quotas that were tied to hourly salaries and a schedule of warnings and penalties for failures to meet quotas. Instead, a team-based approach was initiated. Although a few workers took advantage of the change, overall productivity actually improved as rework decreased because workers were taking pride in their work to produce things the right way first. H&B also eliminated performance appraisals and commission-based pay in sales. The company also has focused its efforts on training and education, resulting in an openness for change and capacity for teamwork. Today, the Deming philosophy is still the core of H&B’s guiding principles.

Juran contends that employees at different levels of an organization speak in different “languages.” (Deming believes statistics should be the common language.) Top management speaks in the language of dollars, workers speak in the language of things, and middle management must be able to speak both languages and translate between dollars and things. Thus, to get top management’s attention, quality issues must be cast in the language they understand—dollars. Juran advocates the accounting and analysis of quality costs to focus attention on quality problems.

At the operational level, Juran focuses on increasing conformance to specifications through elimination of defects, supported extensively by statistical tools for analysis. Juran defines quality as “fitness for use.” This is broken down into four categories: quality of design, quality of conformance, availability, and field service. Quality of design focuses on market research, the product concept, and design specifications. Quality of conformance
includes technology, manpower, and management. Availability focuses on reliability, maintainability, and logistical support. Field service quality comprises promptness, competence, and integrity.

Juran’s prescriptions focus on three major aspects of quality called the Quality Trilogy (a registered trademark of the Juran Institute): quality planning: the process for preparing to meet quality goals; quality control: the process for meeting quality goals during operations; and quality improvement: the process for breaking through to unprecedented levels of performance.

Quality planning begins with identifying customers, both external and internal, determining their needs, and developing product features that respond to customer needs. Quality control involves determining what to control, establishing units of measurement so that data may be objectively evaluated, establishing standards of performance, measuring actual performance, interpreting the difference between actual performance and the standard, and taking action on the difference. Quality improvement is best achieved by identifying specific projects for improvement, getting the right people involved, diagnosing causes of poor performance, developing remedies for the causes, proving that the remedies will be effective, and providing control to hold improvements.

The Crosby Philosophy

Philip B. Crosby, who passed away in 2001, was corporate vice president for quality at International Telephone and Telegraph (ITT) for 14 years after working his way up from line inspector. After leaving ITT, he established Philip Crosby Associates in 1979 to develop and offer training programs. He also was the author of several popular books. His first book, Quality Is Free, sold about one million copies, and is credited with bringing quality to the attention of top American executives.

The essence of Crosby’s quality philosophy is embodied in what he calls the Absolutes of Quality Management and the Basic Elements of Improvement.

Crosby’s Absolutes of Quality Management are as follows:

- **Quality means conformance to requirements not elegance.** Crosby dispels the myth that quality is simply a feeling of “excellence.” Requirements must be clearly stated so that they cannot be misunderstood. Requirements are communication devices and are ironclad. Once a task is done, one can take measurements to determine conformance to requirements. The nonconformance detected is the absence of quality. Quality problems become nonconformance problems—that is, variation in output. Setting requirements is the responsibility of management.

- **There is no such thing as a quality problem.** Problems must be identified by the individuals or departments that cause them. There are accounting problems, manufacturing problems, design problems, front-desk problems, and so on. Quality originates in functional departments, not in the quality
department, and the burden of responsibility for such problems lies with the functional departments. The quality department should measure conformance, report results, and lead the drive to develop a positive attitude toward quality improvement. This is similar to Deming’s Point 3.

• There is no such thing as the economics of quality: it is always cheaper to do the job right the first time. Crosby supports the premise that “economics of quality” has no meaning. Quality is free. What costs money are all the actions that involve not doing jobs right the first time. The Deming Chain Reaction provides a similar message.

• The only performance measurement is the cost of quality. The cost of quality is the expense of nonconformance. Crosby notes that most companies spend 15 to 20 percent of their sales dollars on quality costs. A company with a well-run quality management program can achieve a cost of quality that is less than 2.5 percent of sales, primarily in the prevention and appraisal categories. Crosby’s program calls for measuring and publicizing the cost of poor quality. Quality cost data are useful in calling problems to management’s attention, selecting opportunities for corrective action, and tracking quality improvement over time. Such data provide visible proof of improvement and recognition of achievement. Juran also supports this theme.

• The only performance standard is Zero Defects. According to Crosby:

  Zero Defects is a performance standard. It is the standard of the craftsperson regardless of his or her assignment. . . . The theme of ZD is do it right the first time. That means concentrating on preventing defects rather than just finding and fixing them.

  People are conditioned to believe that error is inevitable; thus they not only accept error, they anticipate it. It does not bother us to make a few errors in our work . . . To err is human. We all have our own standards in business or academic life—our own points at which errors begin to bother us. It is good to get an A in school, but it may be OK to pass with a C.

  We do not maintain these standards, however, when it comes to our personal life. If we did, we should expect to be shortchanged every now and then when we cash our paycheck; we should expect hospital nurses to drop a constant percentage of newborn babies . . . We as individuals do not tolerate these things. We have a dual standard: one for ourselves and one for our work.

  Most human error is caused by lack of attention rather than lack of knowledge. Lack of attention is created when we assume that error is inevitable. If we consider this condition carefully and pledge ourselves to make a constant conscious effort to do our jobs right the first time, we will take a giant step toward eliminating the waste of rework, scrap, and repair that increases cost and reduces individual opportunity.29
Juran and Deming, by contrast, would argue that it is pointless, if not hypocritical, to exhort a line worker to produce perfection, because the overwhelming majority of imperfections are due to poorly designed manufacturing systems beyond the worker’s control.

Crosby’s Basic Elements of Improvement included determination—commitment by the organizational leadership, education, and implementation. Unlike Juran and Deming, Crosby’s program was primarily behavioral. He placed more emphasis on management and organizational processes for changing corporate culture and attitudes than on the use of statistical techniques. Like Juran and unlike Deming, his approach fits well within existing organizational structures.

**PRINCIPLES OF TOTAL QUALITY**

The philosophies of Deming, Juran, and Crosby addressed management deficiencies of the times and laid the foundation for the principles of modern quality management that have transcended time. A definition of total quality was endorsed in 1992 by the chairs and CEOs of nine major U.S. corporations in cooperation with deans of business and engineering departments of major universities, and recognized consultants:

Total Quality (TQ) is a people-focused management system that aims at continual increase in customer satisfaction at continually lower real cost. TQ is a total system approach (not a separate area or program) and an integral part of high-level strategy: it works horizontally across functions and departments, involves all employees, top to bottom, and extends backward and forward to include the supply chain and the customer chain. TQ stresses learning and adaptation to continual change as keys to organizational success.

Adopting a TQ philosophy requires significant changes in organization design, work processes, and culture. Organizations use a variety of approaches. Some emphasize the use of quality tools, such as Six Sigma, but have not made the necessary fundamental changes in their processes and culture. It is easy to focus on tools and techniques but very hard to understand and achieve the necessary changes in human attitudes and behavior. Others have adopted a behavioral focus in which the organization’s people are indoctrinated in a customer-focused culture but fail to incorporate error prevention and design quality or continuous improvement efforts. Still other companies focus on operational improvement efforts but fail to focus on what is truly important to the customer. One-dimensional approaches can have some short-term success but do not seem to work well over time. Total quality requires a comprehensive effort that encompasses a total change in thinking, not a new collection of tools.
The philosophy of TQ involves some very basic management concepts: (1) customer and stakeholder focus; (2) a process orientation; (3) continuous improvement and learning; (4) empowerment and teamwork; (5) management by fact; and (6) visionary leadership that views TQ as a strategic organizational asset.

Customer and Stakeholder Focus

The customer is the judge of quality. Understanding customer needs, both current and future, and keeping pace with changing markets requires effective strategies for listening to and learning from customers, measuring their satisfaction relative to competitors, and building relationships. Customer needs—particularly differences among key customer groups—must be linked closely to an organization’s strategic planning, product design, process improvement, and workforce training activities. Satisfaction and dissatisfaction information are important because understanding them leads to the right improvements that can create satisfied customers who reward the company with loyalty, repeat business, and positive referrals. Creating satisfied customers includes prompt and effective response and solutions to their needs and desires as well as building and maintaining good relationships. A business can achieve success only by understanding and fulfilling the needs of customers. From a total quality perspective, all strategic decisions a company makes are “customer-driven.” In other words, the company shows constant sensitivity to emerging customer and market requirements. This requires an awareness of developments in technology and rapid and flexible response to customer and market needs.

Customer-driven firms measure the factors that drive customer satisfaction. A company close to its customer knows what the customer wants, how the customer uses its products, and anticipates the needs that the customer may not even be able to express. It also continually develops new techniques to obtain customer feedback. Customer opinion surveys and focus groups can help companies understand customer requirements and values. Some companies require their sales and marketing executives to meet with random groups of key customers on a regular basis. Other companies bring customers and suppliers into internal product design and development meetings. Banks, which traditionally have been rather customer-unfriendly—charging customers to speak to real people, for checking accounts, and for ATM access—have made some dramatic changes (see box “Banks Are Discovering that Customers Are People”).

TQ views everyone inside the enterprise as a customer of an internal or external supplier, and a supplier of an external or internal customer. Internal customers—the recipients of any work output, such as the next department in a manufacturing process or the order-picker who receives instructions from an order entry clerk—are as important in assuring quality as are external customers who purchase the product. Failure to meet the needs of internal
Banks Are Discovering that Customers Are People

Washington Mutual, known as “WaMu,” is leading the charge (no pun intended) and changing traditional banking practices to become more customer-focused. In doing so, it has vaulted to become the seventh-largest financial institution in the U.S. and the number 2 home loan lender, increasing its assets by 18,000 percent since 1990. Being located in the same city as the Starbucks chain (Seattle), WaMu has drawn upon Starbucks’ customer-friendly practices to make its operations more attuned to today’s customer, for example, by hiring khaki-clad employees with retail experience and playing hip music in its “stores”—its term for branches. Everyone works on commission, from the branch manager on down; a beginning teller can earn up to $50,000 in his or her first year. WaMu was named one of Fortune’s best places to work. Other banks are following suit; Bank One sent hundreds of employees out into the streets of Chicago to invite potential customers to visit the bank.

customers will likely affect external customers. Employees must view themselves as customers of some employees and suppliers to others. Employees who view themselves as both customers of and suppliers to other employees understand how their work links to the final product. After all, the responsibility of any supplier is to understand and meet customer requirements in the most efficient and effective manner possible.

Customer focus extends beyond the consumer and internal relationships, however. Society represents an important customer of every organization. A world-class company, by definition, is an exemplary corporate citizen. Business ethics, public health and safety measures, concern for the environment, and sharing quality-related information in the company’s business and geographic communities are required. In addition, company support—within reasonable limits of its resources—of national, industry, trade, and community activities and the sharing of nonproprietary quality-related information demonstrate far-reaching benefits.

Process Orientation

The traditional way of viewing an organization is by surveying the vertical dimension—by keeping an eye on an organization chart. However, work gets done (or fails to get done) horizontally or cross-functionally, not hierarchically. One can no longer view an enterprise as a collection of separate, highly specialized individual performers and units, loosely linked by a functional hierarchy.
A process is a sequence of activities that is intended to achieve some result. According to AT&T, a process is how work creates value for customers. We typically think of processes in the context of production: the collection of activities and operations involved in transforming inputs (physical facilities, materials, capital, equipment, people, and energy) into outputs (products and services). Common types of production processes include machining, mixing, assembly, filling orders, or approving loans. However, nearly every major activity within an organization involves a process that crosses traditional organizational boundaries. For example, an order fulfillment process might involve a salesperson placing the order; a marketing representative entering it on the company’s computer system; a credit check by finance; picking, packaging, and shipping by distribution and logistics personnel; invoicing by finance; and installation by field service engineers. This is illustrated in Figure 1.3.

TQ views the enterprise as a system of interdependent processes, linked laterally over time through a network of collaborating (internal and external) suppliers and customers. Each process is connected to the enterprise’s mission and purpose through a hierarchy of micro- and macro-processes. Every process contains sub-processes and is also contained within a higher process. This structure of processes is repeated throughout the hierarchy. A process perspective links all necessary activities together and increases one’s understanding of the entire system, rather than focusing on only a small part (see box “Better Processes, Better Software”). Many of the greatest opportunities for improving organizational performance lie in the organizational interfaces—those spaces between the boxes on an organization chart.

**Figure 1.3  Process versus Function**

Continuous Improvement and Learning

In TQ, the environment in which the enterprise interacts is changing constantly. If the enterprise continues to do what it has done in the past, its future performance relative to the competition will deteriorate. Management’s job, therefore, is to provide the leadership for continual improvement and innovation in processes and systems, products, and services.

Continuous improvement is part of the management of all systems and processes. Achieving the highest levels of performance requires a well-defined and well-executed approach to continuous improvement and learning. “Continuous improvement” refers to both incremental and “breakthrough” improvement. Improvement and learning need to be embedded in the way an organization operates. This means they should be a regular part of daily work, seek to eliminate problems at their source, and be driven by opportunities to do better as well as by problems that need to be corrected.

Improvements may be of several types:

- enhancing value to the customer through new and improved products and services;
- improving productivity and operational performance through better work processes and reductions in errors, defects, and waste;

Better Processes, Better Software

Software crashes and bugs can be irritating at best, and fatal at worst. For example, thousands of trucks and school busses were recalled in 2000 because of faulty software in antilock brakes, and flaws in an altitude warning system were partially responsible for the crash of a Korean Air jet in 1997 that killed 228 people. Experts note that most software is thrown together without adequate testing or a focus on the process of software creation. Defects stem from the complexity of today’s software requirements, pressure to bring out products quickly, lack of liability, and poor work methods. Most programs in testing have 5 to 10 defects per 1,000 lines of code, and it would take 50 person-years to find all of them. In response, Microsoft’s Trustworthy Computing initiative taught programmers to spend more time in planning and thinking about quality, even delaying product launch of Windows Server 2003 software by a year. The Sustainable Computing Consortium stated that engineers and programmers have no way to measure the reliability of their designs, and is trying to create automated tools to analyze software for reliability. Taking a better process-focused approach to software design and development might prevent the “blue screens of death” and, more important, save lives.
- improving flexibility, responsiveness, and cycle time performance; and
- improving organizational management processes through learning.

**Improving Products and Services**

Careful research is required to determine the needs of customers, and those needs must be reflected in the design of products and services. A Japanese professor, Noriaki Kano, suggests that three classes of customer needs exist:

- **Dissatisfiers**—those needs that are expected in a product or service, such as a radio, heater, and required safety features in an automobile. Such items generally are not stated by customers but are assumed as given. If they are not present, the customer is dissatisfied.
- **Satisfiers**—needs that customers say they want, such as air-conditioning or a compact disc player in a car. Fulfilling these needs creates satisfaction.
- **Delighters/exciters**—new or innovative features that customers do not expect. When first introduced, antilock brakes and air bags were examples of exciters. Newer concepts still under development, such as collision avoidance systems, offer other examples. The presence of such unexpected features, if valued, leads to high perceptions of quality.

The importance of this classification is realizing that although satisfiers are relatively easy to determine through routine marketing research, special effort is required to elicit customer perceptions about dissatisfiers and delighters/exciters. Over time, delighters/exciters become satisfiers as customers become used to them (as is the case today with antilock brakes and air bags), and eventually satisfiers become dissatisfiers (customers are dissatisfied if they are not provided). Therefore, companies must innovate continually and study customer perceptions to ensure that their needs are being met.

**Improving Work Processes**

Quality excellence derives from well-designed and well-executed work processes and administrative systems that stress prevention. Improvements in the work processes may lead to major reductions in scrap and defects and, hence, to lower costs, as the example about Dell Computer Corporation shows (see box “Michael Dell’s Touch for Quality”).

**Improving Flexibility, Responsiveness, and Cycle Time**

Success in globally competitive markets requires a capacity for rapid change and flexibility. Electronic commerce, for instance, requires more rapid, flexible, and customized responses than traditional market outlets. **Flexibility** refers to the ability to adapt quickly and effectively to changing requirements. This might mean rapid changeover from one product to another, rapid response to changing demands, or the ability to produce a wide range of customized services. Flexibility might demand special strategies such as modular designs, sharing components, sharing manufacturing lines, and specialized training for employees. It also involves outsourcing decisions, agreements with key suppliers, and innovative partnering arrangements.
Chapter 1: Introduction to Total Quality in Organizations

Michael Dell’s Touch for Quality

Although Dell Computer Corporation’s PCs have had some of the highest quality ratings in the industry, CEO Michael Dell became obsessed with finding a way to reduce their failure rates. The key, he believed, was to reduce the number of times that each hard drive—the most sensitive part of a PC—was handled during assembly. Production lines were revamped, and the number of “touches” were reduced from over 30 to less than 15. Soon after, the rate of rejected hard drives fell by 40 percent, and the overall failure rate for the company PCs dropped by 20 percent.

One important business metric that complements flexibility is cycle time. Cycle time refers to the time it takes to accomplish one cycle of a process—for instance, the time a customer orders a product to the time that it is delivered, or the time to introduce a new product. Reductions in cycle time serve two purposes. First, they speed up work processes so that customer response is improved. Second, reductions in cycle time can only be accomplished by streamlining and simplifying processes to eliminate non-value-added steps such as rework. This forces improvements in quality by reducing the potential for mistakes and errors. By reducing non-value-added steps, costs are reduced as well. Thus, cycle time reductions often drive simultaneous improvements in organization, quality, cost, and productivity. Significant reductions in cycle time cannot be achieved simply by focusing on individual subprocesses; cross-functional processes must be examined all across the organization. This forces the company to understand work at the organizational level and to engage in cooperative behaviors.

Agility is a term that is commonly used to characterize flexibility and short cycle times. Agility is crucial to such customer-focused strategies as mass customization, which requires rapid response and flexibility to changing consumer demand. Enablers of agility include close relationships with customers to understand their emerging needs and requirements, empowering employees as decision makers, effective manufacturing and information technology, close supplier and partner relationships, and breakthrough improvement.

Learning

“Learning” refers to understanding why changes are successful through feedback between practices and results, and leads to new goals and approaches. A learning cycle has four stages:

1. planning,
2. execution of plans,
3. assessment of progress, and
4. revision of plans based upon assessment findings.
Measurements provide critical data and information about key processes, outputs, and results. When supported by sound analytical approaches that project trends and infer cause-and-effect relationships, measurements provide an objective foundation for learning, leading to better customer, operational, and financial performance.

**Empowerment and Teamwork**

A company’s success depends increasingly on the knowledge, skills, and motivation of its workforce. Employee motivation and success depend increasingly on having opportunities to learn and to practice new skills. These can be fostered by empowerment and teamwork. The traditional view of motivation is often summarized by McGregor’s Theory X model of motivation: workers dislike work and require close supervision and control. TQ organizations support the premise of Theory Y: workers are self-motivated, seek responsibility, and exhibit a high degree of imagination and creativity at work. TQ managers provide leadership rather than overt intervention in the processes of their subordinates, who are viewed as process managers rather than functional specialists.

Much evidence supports the role of good human resource practices in organizational performance. For example, one study of call centers found that quit rates were lower and sales growth was higher in firms that emphasized high skills, employee participation in decision making and in teams, and human resource incentives such as better pay and job security.\(^35\)

**Empowerment** simply means giving people authority—to make decisions based on what they feel is right, have control over their work, take risks and learn from mistakes, and promote change; for example, employees can make decisions that satisfy customers without a lot of bureaucratic hassles, and barriers between levels are removed. Empowerment requires, as the management philosophy of Wainwright Industries states, a sincere belief and trust in people. A survey by Annandale, Virginia-based Mastery-Works Inc. concluded that employees leave their organizations because of trust, observing that “Lack of trust was an issue with almost every person who had left an organization.”\(^36\)

In TQ formal and informal mechanisms encourage and facilitate teamwork and team development across the entire enterprise. Competitive behavior—one person against another or one group against another—is not a natural state in TQ. TQ reward systems recognize individual as well as team contributions and reinforce cooperation. The areas for teamwork and collaboration are broad, particularly in education, training, and meaningful involvement of employees in the improvement of processes that they affect and that affect their work. Teamwork can be viewed in three ways:

1. **Vertical**—teamwork between top management and lower-level employees.
2. **Horizontal**—teamwork within work groups and across functional lines (often called cross-functional teams).
3. **Interorganizational**—partnerships with suppliers and customers.
**Vertical Teamwork**

Everyone must participate in quality improvement efforts. The person in any organization who best understands his or her job and how it can be improved is the one performing it. Vertical teamwork is the sharing of responsibility among organizational levels through empowerment. This often represents a profound shift in the philosophy of senior management, as the traditional philosophy is that the workforce should be “managed” to conform to existing business systems. Dana Commercial Credit Corporation has a “just do it” policy to empower its people to act on ideas for improvement without prior approval.

Companies can encourage participation by recognizing team and individual accomplishments, sharing success stories throughout the organization, encouraging risk taking by removing the fear of failure, encouraging the formation of employee involvement teams, implementing suggestion systems that act rapidly, provide feedback, and reward implemented suggestions, and providing financial and technical support to employees to develop their ideas.

Employees need training in skills related to performing their work and to understanding and solving quality-related problems. Frontline workers need the skills to listen to customers; manufacturing workers need specific skills in developing technologies; and all employees need to understand how to use measurements to drive continuous improvement. Training brings all employees to a common understanding of goals and objectives and the means to attain them. Training usually begins with awareness of quality management principles and is followed by specific skills in quality improvement. Training should be reinforced through on-the-job applications of learning, involvement, and empowerment.

**Horizontal Teamwork**

Problem solving and process improvement are best performed by cross-functional work teams. For example, a product development team might consist of designers, manufacturing personnel, suppliers, salespeople, and customers. Texas Instruments Defense Systems & Electronics Group (since acquired by Raytheon) employs corporation teams to work on corporate-level goals, employee effectiveness teams to prevent potential problems in specific work areas, and department action teams to solve departmental problems. Granite Rock Company, with fewer than 400 employees, has about 100 functioning teams, ranging from 10 corporate quality teams to project teams, purchasing teams, task forces, and function teams composed of people who do the same job at different locations.

**Interorganizational Partnerships**

Partnerships must be created both internally and externally. Companies should seek to build partnerships that serve mutual and larger community interests. Partnerships might include those that promote labor-management cooperation such as agreements with unions that entail employee development,
cross-training, or new work organizations. Rather than dictating specifications for purchased parts, a company might develop specifications jointly with suppliers to take advantage of the suppliers’ manufacturing capabilities. Internal partnerships might also involve creating network relationships among company units to improve flexibility, responsiveness, and knowledge sharing. External partnerships might be with suppliers, customers, or educational organizations. Partnerships permit the blending of a company’s core competencies with complementary strengths and capabilities of partners.

Suppliers, in particular, are important partners who need vital information, product designs, performance feedback and assistance, and so on. The aim of the partnership is innovation, reduction in variation of critical characteristics of supplied materials, lower costs, and better quality. The aim may be enhanced by reducing the number of suppliers and establishing long-term relationships.

One example of supplier partnerships involves local telephone companies who provide AT&T access to their customers. Following divestiture, AT&T established a Financial Assurance Organization to check the accuracy of access charges and to correct errors. By 1989, AT&T employed 1,100 people working to duplicate the supplier’s access-billing system, anticipate charges, and resolve problems. In 1990, AT&T began a joint effort with Pacific Bell to design a single access billing verification process—involving both supplier and customer—that shifted focus from correction to prevention, moved accountability for accuracy to the supplier, and replaced post-bill resolution with pre-bill certification. As a result, the time needed in the validation process declined from three months to 24 hours, accuracy went up, and costs came down.

Management by Fact

Organizations need good performance measures for three reasons:

- to lead the entire organization in a particular direction; that is, to drive strategies and organizational change;
- to manage the resources needed to travel in this direction by evaluating the effectiveness of action plans; and
- to operate the processes that make the organization work and continuously improve.37

Data and information support analysis at all organizational levels. The types of information and how it is disseminated and aligned with organizational levels are equally vital to success. At the work level, data provide real-time information to identify assignable reasons for variation, determine root causes, and take corrective action as needed. This might require lean communication channels consisting of bulletins, computerized quality reports, and digital readouts of part dimensions to provide immediate information on what is happening and how things are progressing.
At the process level, operational performance data such as yields, cycle times, and productivity measures help managers determine whether they are doing the right job, whether they are using resources effectively, and whether they are improving. Information at this level generally is aggregated; for example, daily or weekly scrap reports, customer complaint data obtained from customer service representatives, or monthly sales and cost figures faxed in from field offices.

At the organization level, quality and operational performance data from all areas of the firm, along with relevant financial, market, human resource, and supplier data, form the basis for strategic planning and decision making. Such information is highly aggregated and obtained from many different sources throughout the organization.

A company should select performance measures and indicators that best represent the factors that lead to improved customer, operational, and financial performance. These typically include:

- customer satisfaction,
- product and service performance,
- market assessments,
- competitive comparisons,
- supplier performance,
- employee performance, and
- cost and financial performance.

A comprehensive set of measures and indicators tied to customer and company performance requirements provides a clear basis for aligning all activities of the company with its goals.

**Visionary Leadership and a Strategic Orientation**

Leadership for quality is the responsibility of top management. Senior leadership must set directions; create a customer orientation, clear quality values, and high expectations that address the needs of all stakeholders; and build them into the way the company operates. Senior leaders need to commit to the development of the entire workforce and should encourage participation, learning, innovation, and creativity throughout the organization. Reinforcement of the values and expectations requires the substantial personal commitment and involvement of senior management. Through their personal roles in planning, reviewing company quality performance, and recognizing employees for quality achievement, the senior leaders serve as role models, reinforcing the values and encouraging leadership throughout the organization.

If commitment to quality is not a priority, any initiative is doomed to failure. Lip service to quality improvement is the kiss of death. The CEO of Motorola, one of the first Baldrige winners, had quality as the first agenda item at every top management meeting. He frequently left after quality was
discussed, sending the message that once quality was taken care of, financial and other matters would take care of themselves. When The Ritz-Carlton Hotel Company opens a new facility, the CEO works alongside the housekeeping and kitchen staffs making beds and washing dishes. Imagine the message these actions send to the workers! Many companies have a corporate quality council made up of top executives and managers, which sets quality policy and reviews performance goals within the company. Quality should be a major factor in strategic planning and competitive analysis processes.

Many of the management principles and practices required in a TQ environment may be contrary to long-standing practice. Top managers, ideally starting with the CEO, must be the organization’s TQ leaders. The CEO should be the focal point providing broad perspectives and vision, encouragement, and recognition. The leader must be determined to establish TQ initiatives and committed to sustain TQ activities through daily actions in order to overcome employees’ inevitable resistance to change.

Unfortunately, many organizations do not have the commitment and leadership of their top managers. This does not mean that these organizations cannot develop a quality focus. Improved quality can be fostered through the strong leadership of middle managers and the workforce. In many cases, this is where quality begins. Leadership provides people with opportunities for personal growth and development. People are able to take pride and joy in learning and accomplishment, and the ability of the enterprise to succeed is enhanced. People are active contributors, valued for their creativity and intelligence. Every person is a process manager presiding over the transformation of inputs to outputs of greater value to the enterprise and to the ultimate customer. In the long run, however, an organization cannot sustain quality initiatives without strong leadership at the top.

Achieving quality and market leadership requires a strong future orientation and a willingness to make long-term commitments to key stakeholders—customers, employees, suppliers, stockholders, the public, and the community. A focus on quality as a driver of strategic business planning is characteristic of TQ organizations; in others we usually see an emphasis on finance and marketing. Strategic business planning should be the driver for quality excellence throughout the organization and needs to anticipate many changes, such as customers’ expectations, new business and partnering opportunities, the global and electronic marketplace, technological developments, new customer segments, evolving regulatory requirements, community/societal expectations, and strategic changes by competitors. Quality goals are the cornerstone of the business plan. Measures such as customer satisfaction, defect rates, and process cycle times receive as much attention in the strategic plan as financial and marketing objectives. Plans, strategies, and resource allocations need to reflect these influences. Improvements do not happen overnight. The success of market penetration by Japanese manufacturers evolved over several decades.
The principles of TQ are embodied in the business philosophy of many leading companies (see the box on KARLEE for an example of a company that exemplifies these principles). Our purpose in this book is to provide a solid link between concepts of total quality and the traditional management areas of organization theory, organizational behavior, and strategy. When any company begins to think of how to improve, it will be led to the various approaches that are united under the TQ concept. Today, total quality is a matter of survival.

TQ AND AGENCY THEORY

One model in organizational theory that has received considerable attention is agency theory. Agency theory is based on the concept of an agency relationship, in which one party (the principal) engages another party (the agent) to perform work. Agency theory makes the assumption that individuals in agency relationships are utility maximizers and will always take actions to enhance their self-interests. As a consequence, when authority is delegated to agents on behalf of the principal, agents may use this power to promote their own well-being, at the expense of the principal. Monitoring is a central issue in agency theory, because it is a primary mechanism used by both parties to maintain and govern the relationship.

Agency theory provides a stark contrast to TQ. TQ views the management system as one based on social and human values, whereas agency theory is based on an economic perspective that removes people from the equation. Whereas agency theory propounds the belief that people are self-interested and opportunistic and that their rights are conditional and proportional to the value they add to the organization, TQ suggests that people are also motivated by interests other than self, and that people have an innate right to be respected. Agency theory assumes an inherent conflict of goals between agents and principals, and that agent goals are aligned with principal goals through formal contracts. In TQ, everyone in the organization shares common goals and a continuous improvement philosophy, and goals are aligned through adoption of TQ practices and culture. Sharing information to achieve these goals is fundamental to TQ, whereas agency theory suggests that information may be concealed to advance self-interests. TQ takes a long-term perspective based on continuous improvement, whereas agency theory focuses on short-term achievement of the contract between the principal and agent. In TQ, risk taking is necessary in order to innovate, whereas agency theory assumes that risks are to be minimized and shared between the two parties.

Finally, TQ leaders provide a quality vision and play a strategic role in the organization; leaders in agency theory develop control mechanisms and engage in monitoring. TQ proponents argue that it is a superior strategy because a quality culture can be sustained and is less costly in the long term.
Bringing TQ to Life at KARLEE

KARLEE is a contract manufacturer of precision sheet metal and machined components for telecommunications, semiconductor, and medical equipment industries, located in Garland, Texas. Some of the ways it exemplifies the principles of TQ are described below.

**Customer Focus.** KARLEE made a strategic decision to carefully select customers that support its values—particularly a systematic approach to business and performance management, desire for long-term partnerships, and global leadership. Management and Team Leaders work with each customer to establish current requirements and future needs, and each customer is assigned a three-person Customer Service team that is on call 24 hours a day for day-to-day production issues.

**Process Orientation.** Processes such as prototype development, scheduling, production setup, fabrication, assembly, and delivery have process owners responsible for maintaining the process to customer requirements. A Quality Assurance team member works with manufacturing teams to create process documentation.

**Continuous Improvement and Learning.** Teams use a structured approach to evaluate and improve their processes, documenting them, and presenting a status report of improvements to senior leaders and the KARLEE Steering Committee. Teams benchmark competitors, “best practice” companies, and customers to learn from others.

**Empowerment and Teamwork.** Production and delivery processes are designed around cell manufacturing. Teams are responsible for knowing their customer’s requirements and producing according to those requirements.

Teams are empowered to change targets recommended during strategic planning if they believe it will help them achieve higher performance, as well as to schedule work, manage inventory, and design the layout of their work areas.

**Management by Fact.** Teams analyze defect data, customer-reported problems, and control charts generated during production to identify problems and opportunities for improvement. Every business goal and project has defined methods for measurement, and senior leaders meet weekly to review company performance and ensure alignment with directions and plans.

**Leadership and Strategic Planning.** Senior Executive Leaders (SELs) and the KARLEE Leadership Committee (KLC) set the strategic direction of the company, and communicate and reinforce values and expectations through performance reviews, participation in improvement or strategic projects, regular interactions with customers and team members, and recognition of team member achievements.

All this has contributed to an annual average increase in sales growth of 35 percent from 1995 to 2000, and high levels of customer and employee satisfaction, and quality and operational performance.
Agency theory advocates suggest that high performance may be achieved by appropriately structuring agents’ contracts and aligning their interests. As we shall see in Chapter 3, some elements of agency theory are evident in strategy implementation approaches within a TQ environment. Both theories have shaped the activities of scholars and practitioners, and research has yet to arrive at a definitive conclusion. However, it is difficult to argue with the results that firms choosing a clear TQ path have achieved.

**TQ and Organizational Models**

Although TQ is a new way of thinking about the management of organizations, it is not a totally new paradigm. When compared with well-known organizational models, it can be seen as capturing many aspects of these established models and amplifying them by providing a useful methodology. Three major organizational models that management theorists have studied are the mechanistic, organismic, and cultural models of organizations. Contrasts between TQ and these models are summarized in Table 1.2.

The mechanistic model, described by classical management theorists, views an organization as a tool or a machine designed solely to create profits for its owners. Work is reduced to elementary tasks with a focus on efficiency, conformity, and compliance. Although both the mechanistic model and TQ assume that the organization exists to achieve a specific performance goal, TQ has a broader definition of quality. It takes more of an open-systems perspective, which views managers as leaders and visionaries rather than as individuals who plan, organize, direct, and control. It broadens employees’ roles; uses a horizontal, rather than vertical, work organization; and focuses on continuous improvement rather than stability. Narrow-minded managers and those who criticize TQ often view it in a mechanistic sense and do not see the broader implications.

The organismic model views organizational systems as living organisms that depend on their environments for resources and adjust the behavior of their parts to maintain the properties of the whole within acceptable limits. This model assumes that systems goals, such as the need to survive, displace performance goals, such as profit. TQ is similar in that survival in competitive environments is often the primary motivation for adopting it. Customer satisfaction as a definition of quality is compatible with this notion. In the organismic model, organizations are not autonomous entities. This is consistent with the notion of partnership development espoused by TQ: vision replaces fear as a motivator and driver of management actions; employees work for shared beliefs and values; horizontal communication becomes as important as vertical communication and direction in stressing coordination and organizational rationality; and the organization must adapt to a broad array of external forces. It is evident that TQ shares many similarities with this organizational model. This helps explain why many practitioners have
<table>
<thead>
<tr>
<th>Dimension</th>
<th>TQ Paradigm</th>
<th>Mechanistic Model</th>
<th>Organismic Model</th>
<th>Cultural Model</th>
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<td>Goal</td>
<td>Long-term survival</td>
<td>Organizational efficiency and performance</td>
<td>Organizational survival</td>
<td>Meet individual needs; human development</td>
</tr>
<tr>
<td>Definition of quality</td>
<td>Satisfying or delighting the customer</td>
<td>Conformance to standards</td>
<td>Customer satisfaction</td>
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<td>Role/nature of environment</td>
<td>Blurred organization and environmental boundaries</td>
<td>Objective; outside boundary</td>
<td>Objective; inside boundary</td>
<td>Enacted/ boundaries defined through relationships</td>
</tr>
<tr>
<td>Role of management</td>
<td>Focus on improvement and creating a system that can produce quality outcomes</td>
<td>Coordinate and provide visible control</td>
<td>Coordinate and provide invisible control by creating vision and system</td>
<td>Coordinate and mediate negotiations regarding vision, system, rewards</td>
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<tr>
<td>Role of employees</td>
<td>Employees are empowered; training and education provide needed skills</td>
<td>Passive; follow orders</td>
<td>Reactive/self-control within system parameters</td>
<td>Active/self-control; participate in creation of vision, system</td>
</tr>
<tr>
<td>Structural rationality</td>
<td>Horizontal processes beginning with suppliers and ending with customers and supported by teams</td>
<td>Chain of command (vertical)</td>
<td>Process flow (horizontal and vertical)</td>
<td>Mutual adjustment in any direction</td>
</tr>
<tr>
<td>Philosophy toward change</td>
<td>Change, continuous improvement, and learning are encouraged</td>
<td>Technical rationality</td>
<td>Organizational rationality</td>
<td>Political rationality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Stability is valued; learning arises from specialization</td>
<td>Change and learning assist adaptation</td>
<td>Change and learning are valued in themselves</td>
</tr>
</tbody>
</table>

Viewed TQ as something new, whereas many academics recognize its roots in systems theory that was popular decades ago. The cultural model views an organization as a collection of cooperative agreements entered into by individuals with free will. The organization's culture and social environment are enacted or socially constructed by organization members. From the perspective of this model, the goal of an organization is to serve the diverse needs of all whom it affects—its stakeholders—a view often expressed by TQ philosophers. Because of the multiplicity of
stakeholders, quality has many meanings, although some degree of consensus regarding the organization’s values and purposes is needed. Although TQ generally assumes that organizations must adapt to the expectations of customers, more recent views of building partnerships and sharing of best practices (even with competitors) is consistent with the cultural model. In the cultural model, managers take on a more distinctive leadership role, relinquishing control and sharing power in order to meet the needs of the many individuals in the organization; employees have greater voice in establishing organizational goals; all structural decisions are value-based and have clear implications with regard to individual autonomy (political rationality); and learning needs are driven not by adaptation to environmental forces but in response to individual needs. Many of these attributes are characteristic of recent trends in the evolution of TQ themes in high-performing organizations.

In summary, TQ appears to have evolved from reactionary influences against the mechanistic model of management and embraced many of the characteristics of the organismic model. Recent trends, however, suggest that ideas from the cultural model are influencing the maturity of TQ in modern organizations. This will become more evident as we discuss the Malcolm Baldrige Criteria for Performance Excellence in the next chapter.

**REVIEW AND DISCUSSION QUESTIONS**

1. Explain why quality became the most important issue facing American business in the 1980s. In addition to economic competition from Japan, what other factors may have contributed to the importance that quality has assumed?

2. Cite several examples in your own experience in which your expectations were met, exceeded, or not met in purchasing goods or services. How did you regard the company after your experience?

3. How might the definition of quality apply to your college or university? Provide examples of who some customers are and how their expectations can be met or exceeded.

4. Think of a product with which you are familiar. Describe the eight “multiple quality dimensions” for this product that are listed in this chapter.

5. What might the eight “multiple quality dimensions” mean for a college or university? For a classroom?

6. Explain the differences between manufacturing and service organizations and their implications for quality.

7. Summarize the Deming management philosophy. Why has it been controversial?

8. Explain the 14 Points in the context of the four categories of Profound Knowledge.

9. How might Deming’s concepts of variation be applied to the classroom?
10. Why doesn’t the Deming Chain Reaction terminate with “Increased Profits”? Would this contradict the basis of Deming’s philosophy?

11. Provide an example of a system with which you are familiar and define its purpose. Examine the interactions within the system and whether the system is managed for optimization.

12. Describe a process with which you are familiar. List some factors that contribute to common cause variation. Cite some examples of special causes of variation in this process.

13. How does the theory of knowledge apply to education? What might this mean for improving the quality of education?

14. Explain the implications of not understanding the components of Profound Knowledge as suggested by Peter Scholtes.

15. Extract three or four key themes in Deming’s 14 Points. How might the 14 Points be grouped in a logical fashion?

16. What implications might the 14 Points have for college education? What specific proposals might you suggest as a means of implementing the 14 Points at your school?

17. Discuss the interrelationships among Deming’s 14 Points. How do they support each other? Why must they be viewed as a whole rather than separately?

18. The following themes form the basis for Deming’s philosophy. Classify the 14 Points into these categories and discuss the commonalities within each category:
   a. Organizational purpose and mission
   b. Quantitative goals
   c. Revolution of management philosophy
   d. Elimination of seat-of-the-pants decisions
   e. Cooperation building
   f. Improvement of manager-worker relations

19. Summarize Juran’s philosophy. How is it similar to and different from Deming’s?

20. What is Juran’s Quality Trilogy? Is it any different from management approaches in other functional areas of business, such as finance?

21. What implications might Juran’s Quality Trilogy have for colleges and universities? Would most faculty and administrators agree that the emphasis has been on quality control rather than planning and improvement?

22. How could you apply Juran’s Quality Trilogy to improve your personal approach to study and learning?

23. Summarize the Crosby philosophy. How does it differ from Deming and Juran?

24. Which quality philosophy—Deming, Juran, or Crosby—do you personally feel more comfortable with? Why?

25. Describe the key elements of total quality.
26. Why is a customer focus a critical element of TQ?
27. How might you apply the concepts of total quality to your personal life? Consider your relations with others and your daily activities such as being a student, belonging to a fraternity or professional organization, and so on.
28. Make a list of your personal “customers.” What steps might you take to understand their needs and remain “close” to them?
29. Cite an example in which you did not purchase a product or service because it lacked “dissatisfiers” as defined in the chapter. Cite another example in which you received some “exciters/delighters” that you did not expect.
30. In what ways might the lack of top management leadership in a quality effort hinder or destroy it?
31. Explain the various areas within an organization in which continuous improvement and learning may take place.
32. Why is measurement important in a TQ effort?
33. Examine some process with which you are familiar. Make a list of ways that the process can be measured and improved. What difficulties might you face in implementing these ideas?
34. Describe the three ways of viewing teamwork.
35. Describe some possible ways in which vertical, horizontal, and inter-organizational teamwork can be applied at a college or university.
36. What does empowerment mean? How might an employee really know that he or she is truly empowered?
37. Have you ever felt restricted in your work because of a lack of empowerment? Can you cite any experiences in which you noticed a lack of empowerment in a person who was serving you? Why is this such a difficult concept to implement in organizations?
38. Explain the key differences between “traditional” management practices and those in a TQ environment.
39. Prepare a self-assessment questionnaire designed to determine whether an organization follows traditional management practices or a TQ approach. You might consider applying it to some organization.
40. How does TQ differ from agency theory?
41. Explain the mechanistic, organismic, and cultural models of organizations, and how TQ is similar to or different from them.
42. Investigate recent quality initiatives in either health care or education. What have these organizations learned from business? What unique issues do they face with respect to quality? How are they trying to overcome them?
43. Discuss the implications of the following statements with respect to introducing TQ principles in a college classroom. Do you agree with them? How do they reflect TQ principles? What changes in traditional learning approaches would they require for both students and instructors?
a. Embracing a customer focus doesn’t mean giving students all As and abandoning standards.
b. If students fail, the system has failed.
c. Faculty members are customers of those who teach prerequisites.
d. Treating students as customers means allowing students to choose not to come to class.
e. Completing the syllabus is not a measure of success.
f. New and tenured instructors should visit each other’s classrooms.
g. Eliminate performance appraisals based on classroom evaluations.
h. No matter how good the test, luck will be involved.

44. For each of the principles of TQ (customer focus, process orientation, etc.) describe what you might see if you spent time in each of the following types of organizations:
   a. one with primarily traditional management practices;
   b. one that has a beginning awareness of the importance of TQ;
   c. one that has developed an effective system for TQ;
   d. one that has outstanding, world-class management practices.

**CASES**

**Building Trust through Quality at Gerber**

Gerber is the leader in the development, manufacturing, and marketing of foods and products for children from birth through age three. The Gerber baby picture—which accompanies everything from strained carrots and banana cookies to teething rings and diapers—has developed into one of the most recognizable brand images in the world. The Gerber company has long been a leader in using TQ approaches to uphold its reputation. Although Gerber’s quality programs have gone through various stages over the years, its goal has remained the same: to make sure consumers continue to see the Gerber baby, which has gone through periodic updatings of its own, as an emblem of excellence.

The company began in the Gerber family kitchen in 1927. After watching her husband’s messy attempt at straining peas for their daughter, Dorothy Gerber suggested that the task would be better accomplished at the family-owned canning plant. Daniel Gerber agreed and was so taken by the idea that within a year he had manufactured enough of five baby food flavors to begin national distribution. Understanding the concern parents have for what their babies consume, Gerber paid close attention to what went into the food and the processes involved in manufacturing it. This was one of the company’s first steps toward committing to quality.

While Gerber’s quality systems have undergone several improvements over the years, teamwork was “one of the biggest things to hit quality at Gerber,” says George Sheffier, a retired, 35-year Gerber veteran. He believes
that fostering a team atmosphere taught Gerber how to help employees adjust to change, gave the company a head start on the diversity issues of the 1990s, and was critical when Gerber began spreading quality techniques throughout its plants.

Gerber experimented with teams in the 1970s but by the end of the decade the company still lacked the benefits a solid team atmosphere provided. An attempt to implement the concept to a more intense degree in 1983 was met by employee skepticism. Realizing that management and supervisors were themselves having a difficult time adjusting to the team methodology, Gerber hired consultants to teach facilitation skills. Soon supervisors were holding meetings not only to familiarize workers with the team concept but to discuss change—how employees felt about it and what the company could do to help make it easier. As employees began feeling more comfortable working in teams, they voiced concerns about trouble spots in systems and processes. Gerber also learned that the team atmosphere was a necessity in linking quality to every process in the company.

Once employees recognized the value of teamwork, the company began taking quality functions out of the quality department and spreading them throughout the plant. The goal of integrating quality into manufacturing was to build quality into the product on a more consistent basis. By expanding quality responsibilities to frontline operations, Gerber hoped to increase process control and reduce line inspections. To accomplish this purpose, Gerber teamed quality assurance (QA) staff with frontline operators in 1988 to establish procedures for each process. While hesitant at first, frontline employees liked the fact that they were involved in the process from the start and were able to determine their own auditing criteria. Within 18 months, Gerber was able to cut its number of line inspectors and increase its quality auditing functions.

As quality became widespread through the organization, Gerber needed to teach basic quality tools to its frontline operators. As with the team concept, however, employees accepted the new responsibilities once they realized the values of the tools. Employees came to prefer the use of these techniques, which enabled them to become more directly involved with the quality of the final product. The company also established management incentives for integrating quality into its manufacturing process. Many senior managers, for example, began to be compensated for maintaining a high level of consumer trust through the quality of the final product. Today, the company continues to improve the quality techniques it applies to each part of the manufacturing process. Its most recent project has been to install new software from SAS Institute Inc. The software gives employees instant access to data regarding the impact on the final product of each station in each process.

Although Gerber has always tried to create systems that meet the expectations of parents, the company didn’t always utilize feedback from its customers. It wasn’t until the company faced its largest crisis to date that Gerber
realized the need to link the customer’s voice with the quality system. This period, in the 1980s, was a defining point for Gerber, according to Gerber senior QA manager Jim Fisher. The company lost some trust in the eyes of the consumer, stemming from an instance of consumer tampering that brought Gerber unwanted national attention. Before the company had the opportunity to prove itself, the case snowballed into a media frenzy, leaving consumers questioning Gerber’s quality. Gerber’s history of continuous improvement and its well-documented manufacturing processes paid off, however. The investigation put the company under a microscope, with Fisher flying across the country to inspect jars of food and the Food and Drug Administration (FDA) spending three weeks reviewing Gerber’s systems and records. In the end, the FDA gave the company a clean bill of health, and any claims against Gerber dissipated once the FDA’s report became available to the public.

What Gerber found was that it needed a system allowing consumers to contact it directly with suggestions, complaints, and questions pertaining to Gerber products or infant care in general. Gerber’s consumer relations department, established and operated by Dorothy Gerber in 1938, continued to receive a steady flow of letters, but the system wasn’t timely and the feedback wasn’t closely tied to either the quality or the safety department. Consequently, Gerber opened its telephone information service (800-4-GERBER) in 1986. The system provided a notable change for the company’s quality discipline as it allowed telephone operators to log customer information into a database. In turn, trend analysis could be conducted and consumer demands could be integrated into the product development process. Because parents are up with their infants throughout the night, the company extended the department’s operating hours in 1991, capturing information 24 hours a day. Gerber takes a daily average of 2,400 calls, accommodating all languages, and employs a team of letter correspondents to answer the 45,000 letters it receives yearly.

In 1947 Gerber management came to believe that the best way to ensure the safety of its product was to control as much of the food-making process as possible. At that time the company began forming alliances with its growers, giving Gerber better control of produce cultivation and allowing it to keep track of the pesticides growers used. By the 1950s, Gerber had implemented a proactive approach to controlling its manufacturing processes. The Gerber product analysis laboratories were formed in 1963 to provide data on the composition of ingredients, monitor the quality of internal and external water sources, and provide the analytical information needed to establish food formulations.

The company also created procedures to monitor potential hazards and ensured correctly functioning processes by employing a thermal processing staff. The staff was to determine the amount of time a product needs to be cooked to become commercially sterile, conduct audits of production facilities to ensure that processing equipment was operating correctly, and review
and improve thermal processing systems. The thermal processing staff grew so large that it became its own department in 1994, and it continues to work closely with Gerber’s quality and safety departments today.

Gerber’s dedication to performance excellence continues to serve the company well. Thinking beyond quality trends in pesticide control continues to put the company ahead of others as Gerber investigates what it calls environmental quality—examining environmental factors not traditionally considered, such as pollutants carried into the plant by a supplier. This enabled Gerber to introduce sugarless and starch-free formulations less than a year after a 1995 report criticized the baby food industry for its use of fillers. By linking quality practices throughout its processes and making statistical information available to all employees, Gerber continues to enhance its quality.

Discussion Questions
1. From what definitional perspective does Gerber view quality?
2. How does Gerber exhibit the fundamental principles of total quality described in this chapter?

The Reservation Clerk

Mary Matthews works for an airline as a reservation clerk. Her duties include answering the telephone, making reservations, and providing information to customers. Her supervisor told her to be courteous and not to rush callers. However, the supervisor also told her that she must answer 25 calls per hour so that the department’s account manager can prepare an adequate budget. Mary comes home each day frustrated because the computer is slow in delivering information that she needs, and sometimes reports no information. Without information from the computer, she is forced to use printed directories and guides.

Discussion Questions
1. What is Mary’s job? What might Deming have said about this situation?
2. Drawing upon Deming’s principles, outline a plan to improve this situation.

The Reservation Nightmare

H. James Harrington, a noted quality consultant, related the following story in Quality Digest magazine: I called to make a flight reservation just an hour ago. The telephone rang five times before a recorded voice answered. “Thank you for calling ABC Travel Services,” it said. “To ensure the highest level of customer service, this call may be recorded for future analysis.” Next, I was asked to select from one of the following three choices: “If the trip is related to company business, press 1. Personal business, press 2. Group travel, press 3.” I pressed 1.
I was then asked to select from the following four choices: “If this is a trip within the United States, press 1. International, press 2. Scheduled training, press 3. Related to a conference, press 4.” Because I was going to Canada, I pressed 2.

Now two minutes into my telephone call, I was instructed to be sure that I had my customer identification card available. A few seconds passed and a very sweet voice came on, saying, “All international operators are busy, but please hold because you are a very important customer.” The voice was then replaced by music. About two minutes later, another recorded message said, “Our operators are still busy, but please hold and the first available operator will take care of you.” More music. Then yet another message: “Our operators are still busy, but please hold. Your business is important to us.” More bad music. Finally the sweet voice returned, stating, “To speed up your service, enter your 19-digit customer service number.” I frantically searched for their card, hoping that I could find it before I was cut off. I was lucky; I found it and entered the number in time. The same sweet voice came back to me, saying, “To confirm your customer service number, enter the last four digits of your social security number.” I pushed the four numbers on the keypad. The voice said: “Thank you. An operator will be with you shortly. If your call is an emergency, you can call 1-800-CAL-HELP, or push all of the buttons on the telephone at the same time. Otherwise, please hold, as you are a very important customer.” This time, in place of music, I heard a commercial about the service that the company provides.

At last, a real person answered the telephone and asked, “Can I help you?” I replied, “Yes, oh yes.” He answered, “Please give me your 19-digit customer service number, followed by the last four digits of your social security number so I can verify who you are.” (I thought I gave these numbers in the first place to speed up service. Why do I have to rattle them off again?)

I was now convinced that he would call me Mr. 5523-3675-0714-1313-040. But, to my surprise, he said: “Yes, Mr. Harrington. Where do you want to go and when?” I explained that I wanted to go to Montreal the following Monday morning. He replied: “I only handle domestic reservations. Our international desk has a new telephone number: 1-800-1WE-GOTU. I’ll transfer you.” A few clicks later a message came on, saying: “All of our international operators are busy. Please hold and your call will be answered in the order it was received. Do not hang up or redial, as it will only delay our response to your call. Please continue to hold, as your business is important to us.”

**Discussion Questions**
1. Summarize the service failures associated with this experience.
2. What might the travel agency have done to guarantee a better service experience for Mr. Harrington? How do your suggestions relate to the TQ principles?
Skilled Care Pharmacy

Skilled Care Pharmacy, located in Mason, Ohio, is a $25 million privately held regional provider of pharmaceutical products delivered within the long-term care, assisted living, hospice, and group home environments. The following products are included within this service:

- medications and related billing services;
- medical records;
- information systems;
- continuing education; and
- consulting services to include pharmacy, nursing, dietary, and social services.

The key customer groups that Skilled Care provides services to include the senior population housed within the extended and long-term care environments. Customers within this sector depend on Skilled Care to provide their daily pharmaceutical needs at a competitive rate. Because of the high risk factor of its business, these needs require that the right drug be delivered to the right patient at the right time. Moreover, depending on the environment being served, different medication dispensing methods may be used such as vials, multidose packaging, or unit dose boxes. Also, depending on the customer type, specific delivery requirements may be implemented to better serve the end user.

Skilled Care’s dedication and commitment to continuous quality improvement is evident throughout its internal and external operations. By reflecting on the principles needed to attain quality success across all levels of customers, Skilled Care adopted the quality policy statement shown in Figure 1.4. Skilled Care’s employee population includes 176 culturally diverse associates committed to a substance-free workplace. The team

Figure 1.4  Skilled Care Pharmacy’s Quality Policy

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<th>Our Quality Policy</th>
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<tr>
<td><strong>S</strong></td>
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<tr>
<td>Services and products that meet or exceed both our internal and external customers’ expectations</td>
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<tr>
<td><strong>C</strong></td>
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<tr>
<td>Leading to Complete customer satisfaction</td>
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<td><strong>P</strong></td>
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<td>Resulting in People working together to enhance the lives of those served</td>
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includes associates with all levels of educational training representing many of the following disciplines: pharmacists, pharmacy technicians, medical data entry, accountants, billing specialists, nurses, human resources, sales/marketing, purchasing, administrative and administrative assistance, delivery, customer service representatives, and IT certified personnel. At times, multifaceted work teams are formed through cross-functional approaches to complete the task(s) at hand. Skilled Care’s deliverables are generated from its sole 24,000-square foot location in Mason, Ohio. The pharmacy, which is open 24 hours a day, 365 days a year, is secured by a Honeywell alarm system. The company’s primary technology rests within its pharmacy software, Rescot. This system enables Skilled Care to process, bill, and generate pertinent data critical to the overall operations of the company. Other partnerships have also been established within Skilled Care’s multidosed packaging capabilities and wholesaler purchasing interface.

SCP utilizes the Internet for publishing pertinent information and news as well as hosts a Web-enabled customer service application called Track-It to report specific information about customer issues for company-wide resolution. Advantages of e-commerce include quicker customer service response time for all areas of service including placing the order, pharmacist’s review, delivery, and billing of the product.

Skilled Care Pharmacy faces key strategic challenges from the rapidly evolving financial structure of health care, a shortage of licensed pharmacist personnel, the constant evolution of medical practice, and employee retention at all levels. These as well as future challenges are always balanced with the responsibility to the stakeholders.

**Discussion Questions**
1. How might different definitions of quality apply to Skilled Care?
2. How are the principles of total quality reflected in Skilled Care’s policy and operations?
3. Given the nature of Skilled Care’s operations and the challenges it faces, discuss how a total quality approach can help the company meet these challenges and improve its ability to provide the services its customers need.

**ENDNOTES**
44. Appreciation for materials in this case is expressed to Nancy Mlinarik, VP of Quality, Skilled Care, Inc.