In this chapter we will introduce you to the basic principles of total quality. 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,”
- provide an overview of the key principles of total quality,
- 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**

To appreciate the impact that quality has had on business, especially in the United States, one need only look at the financial and operational results achieved by companies that have embraced quality as a basic business principle:

- Texas Nameplate Company, with under 70 employees, increased its national market share from less than 3 percent to 5 percent over three years, reduced its defects from 3.65 percent of billings to about 1 percent of billings, and increased on-time delivery from 95 to 98 percent.

- STMicroelectronics, Inc.—Region Americas reduced lost-day injuries from 1.01 per 100 workers to 0.65 in three years, which is 74 percent
below the industry average, and increased employee satisfaction levels to a level that exceeded the industry composite in eight of ten categories.

- Over five years, Solar Turbines, Inc., a subsidiary of Caterpillar, Inc., saw its new product development cycle decrease from 39 to 22 months, warranty claims decrease significantly, and revenues per employee increase 61 percent.
- Dana Corporation—Spicer Driveshaft Division 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.
- Operations Management International, Inc., realized a 15 percent average annual growth rate while top competitor revenues dropped by 4.5 percent. Eighty-eight percent of industrial clients say the company exceeds expectations.

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.

One wonders whether quality has lost its importance. We think not. First, consumers are intelligent enough to recognize quality issues that firms face today (see box). Second, the business press, which hyped quality in the early 1990s only to drop it like a hot potato, has renewed the charge. The December 18, 2000, issue of *Business Week* includes an editorial titled “The War for Better

### 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)
Quality Is Far From Won” by Jeffrey E. Garten, dean of the Yale School of Management. He observes: “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.

Total quality—a comprehensive, organization-wide effort to improve the quality of products and services—applies not only to large manufacturers, but to small companies like Trident Precision Manufacturing (see box).

**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 J uskiw attended a symposium offered by Xerox Corporation about its Leadership Through Quality strategy. When J uskiw 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.
All organizations—large and small, manufacturing and service, profit and not-for-profit—can benefit from applying the principles of total quality.

**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. 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.

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 post-war 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.3

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 like 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. One hospital, for example, lowered its rate of post-surgical 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.” 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 an engineering-based technical discipline.

As quality principles have matured in organizations, attention to quality as “something new” has faded, and the term “total quality management (TQM),” which was popular throughout the 1980s and early 1990s, has all but fallen out of the business vernacular. Critics suggested that “TQM is as dead as a pet rock” (Business Week, June 23, 1997, p. 47). 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. Reasons for failure of quality initiatives are rooted in organizational approaches and systems, many of which this book addresses. As the 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 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 highly sophisticated, statistically based tools as part of popular “Six Sigma” initiatives (see chapter 3). 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
Part I: Introduction to Total Quality

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).

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.
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 pre-established 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 nongoods 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 must therefore 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 have made it difficult for many service organizations to apply total quality principles.

Many service organizations have well-developed quality assurance systems. Most 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 box). However, service organizations have special requirements that manufacturing systems cannot fulfill. The most important dimensions of service quality include the following:\(^\text{12}\)

- **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?
- **Accuracy**: Is the service performed right the first time?
- **Responsiveness**: Can service personnel react quickly and resolve unexpected problems?

**Knock Three Times\(^\text{13}\)**

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.

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:\(^\text{14}\)
• 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 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. The Baldrige Award criteria, discussed in chapter 2, do not distinguish between manufacturing and service, even though awards are given in both categories.

**Principles of Total Quality**

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.\[15\]

The foundation of total quality is philosophical: the scientific method. TQ includes systems, methods, and tools. The systems permit change; the philosophy stays the same. TQ is anchored in values that stress the dignity of the individual and the power of community action.

There probably are as many different approaches to TQ as there are businesses. However, most share some basic elements: (1) customer focus, (2) a process orientation, (3) continuous improvement and learning, (4) empowerment and teamwork, (5) management by fact, and (6) leadership and strategic planning.

**Customer 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. The Coca-Cola Company is one example of good customer relationship management (see box).

A firm also must recognize that 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 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

Coke Stays Close to the Customer

While companies concerned about quality try to minimize problems that cause customer dissatisfaction, all companies occasionally receive complaints from customers. Often the response to such complaints can make the difference between keeping and losing a loyal customer. The Coca-Cola Company’s Industry & Consumer Affairs department is responsible for all consumer contacts with the company’s headquarters in Atlanta. The mission of the department is “to protect and enhance Coca-Cola’s trademarks and image by providing a communications link between consumers and company management.” The department’s 60 employees handle over 500,000 contacts each year, both by mail and via the Company’s toll-free hotline (1-800-GET-COKE). Most of the contacts are inquiries about the product.

If a customer does call with a complaint, Coca-Cola sends the customer a letter apologizing for the problem, as well as coupons that allow the customer to replace the unacceptable product. As Roger Nunley, director of Industry & Consumer Affairs puts it, “We strive to exceed customer expectations every time. We want our customers to be excited and pleased with our response.” In certain circumstances, the local Coca-Cola bottler may also follow up with the customer.

A Service Quality Survey is mailed to the customer two weeks after the initial contact. The survey asks the customer to rate the quality of the response, as well as the quality of the phone agent or letter writer (for example, how courteous or professional the company representative was). The survey also asks whether the customer will continue to purchase products of the Coca-Cola Company. According to the company’s most recent data, 90 percent of customers were satisfied with how their complaint was handled, but in the spirit of continuous improvement, the company aspires to 100 percent satisfaction.
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 business. 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. 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.\textsuperscript{17} 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 1.1. 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. Many of the greatest opportunities for improving organizational performance lie in the organizational interfaces—those spaces between the boxes on an organization chart.

Continuous Improvement and Learning

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 opportu-
nities 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; and
- improving flexibility, responsiveness, and cycle time performance.

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).

**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.

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

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**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.
streamlining and simplifying processes to eliminate non–value-added steps such as rework (see box). 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.

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**Faster Clinical Testing at Procter & Gamble**

One example of cycle time reduction is Procter & Gamble’s over-the-counter (OTC) clinical division, which conducts clinical studies that involve testing drugs, health care products, or treatments in humans. Such testing follows rigorous design, conduct, analysis, and summary of the data collected. P&G had at least four different ways to perform a clinical study and needed to find the best way to meet its research and development needs. To do this, they focused on cycle time reduction. Their approach built on fundamental TQ principles: a focus on the customer, fact-based decisions, continual improvement, empowerment, the right leadership structure, and an understanding of work processes. An example is shown in Figure 1.2. The team found that final reports took months to prepare. Only by mapping the existing process did they fully understand the causes of long production times and the amount of rework and recycling during review and sign-off. By restructuring the activities from sequential to parallel work and identifying critical measurements to monitor the process, they were able to reduce the time to less than four weeks.
FIGURE 1.2  EXAMPLE OF PROCESS AND CYCLE TIME IMPROVEMENT

How a final report is actually prepared

Treatments complete

Complete statistics

Draft statistical and medical summaries

Integrate summaries, make consistent with basic protocol info in draft report

Sequential review, negotiate changes one-on-one

Perform quality control corrections

Circulate for final sign-off

Changes required?

Yes

No

Investigator signs final report

How a final report should be prepared

Treatments complete

Complete statistics

Draft statistical and medical summaries

Integrate summaries in draft report

Perform quality control corrections

Board review of draft product

Core teams meet to integrate comments, final sign-off

Initial draft report prepared from basic protocol info during treatment phase

Investigator signs final report

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 success depends increasingly on having opportunities to learn and to practice new skills. This can be fostered by empowerment and teamwork. 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, Va.-based MasteryWorks 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.”

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 ten 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.

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 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.21

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.
Leadership and Strategic Planning

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, as discussed later in this chapter. 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 involvement of the workforce. In many cases, this is where quality begins. In the long run, however, an organization cannot sustain quality initiatives without strong top management leadership.

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. 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. 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.

These principles will continue to develop in organizations (see the box on page 28 for an example of a company that exemplifies these principles).

**TQ and Traditional Management Practices**

TQ is quite different from traditional management practices, requiring significant changes in organizational processes, beliefs and attitudes, and behaviors. “Traditional management” means the way things are usually done in most organizations in the absence of a TQ focus. Many “traditional” organizations have been applying TQ principles all along, so not all of these comments pertain to every organization. The nature of TQ differs from common management practices in many respects. Among the key differences that will be explored in greater depth throughout this book are the following:

1. **Strategic Planning and Management**
   In traditional management, financial and marketing issues such as profitability, return on investments, and market share drive strategic planning. Quality planning activities are delegated to the “quality control” department. Long-term quality initiatives are viewed as being costly and not contributing to the ultimate performance measure—profit. Quality planning and strategic business planning are indistinguishable in TQ. 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.

2. **Changing Relationships with Customers and Suppliers**
   In traditional management, quality is defined as adherence to internal specifications and standards. Quality is measured only by the absence of defects. Inspection of people’s work by others is necessary to control defects. In TQ, quality is defined as products and services beyond present needs and expectations of customers. Innovation is required to meet and exceed customers’ needs.

   Traditional management places customers outside of the enterprise and within the domain of marketing and sales. TQ views everyone inside the enterprise as a customer of an internal or external supplier, and a supplier of an external or internal customer. Marketing concepts and tools can be used to assess internal customer needs and to communicate internal supplier capabilities.

   In traditional management, suppliers are pitted against each other to get the lowest price. The more competing suppliers there are, the better
Bringing TQ to Life at KARLEE

KARLEE is a contract manufacturer of precision sheet metal and machined components for telecommunications, semi-conductor, 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.
it is for the customer company. In TQ, suppliers are partners with their customers. 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.

3. Organizational Structure
Traditional management views an enterprise as a collection of separate, highly specialized individual performers and units, loosely linked by a functional hierarchy. Lateral connections are made by intermediaries close to the top of the organization. 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 macroprocesses. Every process contains subprocesses and is also contained within a higher process. This structure of processes is repeated throughout the hierarchy.

In traditional management, hierarchical “chimney” organization structures promote identification with functions and tend to create competition, conflict, and adversarial relations between functions. In TQ formal and informal mechanisms encourage and facilitate teamwork and team development across the entire enterprise.

4. Organizational Change
Once a traditional organization has found a formula for success, it keeps following it. Management’s job is to prevent change, to maintain the status quo. 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. External change is inevitable, but a favorable future can be shaped.

5. Teamwork
In traditional management, individuals and departments work for themselves. Individuals are driven by short-term performance measures, have narrowly defined jobs, and rarely see how they fit into the whole process or system. Little communication and cooperation exists between design and manufacturing, manufacturing and marketing, and sales/service and design. In TQ individuals cooperate in team structures such as quality circles, steering committees, and self-directed work teams. Departments work together toward system optimization through cross-functional teamwork.

The adversarial relationship between union and management is inevitable in traditional management. The only room for negotiation is in areas such as wages, health, and safety. In TQ the union is a partner and a stakeholder in the success of the enterprise. The areas for partnership 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.
6. Motivation and Job Design
Motivation in traditional management is often akin to 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. People are motivated to make meaningful contributions to what they believe is an important and noble cause, of value to the enterprise and society.

In traditional management, competition is inevitable and inherent in human nature. Performance appraisal, recognition, and reward systems place people in an internally competitive environment. Individualism is reinforced to the detriment of teamwork. 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.

7. Management and Leadership
Traditional management views people as interchangeable commodities, developed to meet the perceived needs of the enterprise. People are passive contributors with little autonomy—doing what they are told and nothing more. TQ views people as the enterprise’s true competitive edge. 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 traditional management, control is achieved by pre-established inflexible responsive patterns given in the book of rules and procedures. People are customers of a “book” that prescribes appropriate behaviors. In TQ, control is achieved by shared values and beliefs in the organization, knowledge of mission, purpose, and customer requirements.

The principles of TQ are embodied in the business philosophy of many leading companies such as KARLEE that we highlighted earlier. 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 rela-
Chapter 1: Introduction to Total Quality in Organizations

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 1.1. 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. While 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 viewed TQ as something new, while 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
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.

### Table 1.1 Summary of TQ and Organizational Models (Adapted from Spencer, 1994)

<table>
<thead>
<tr>
<th>Dimension</th>
<th>TQ Paradigm</th>
<th>Mechanistic Model</th>
<th>Organismic Model</th>
<th>Cultural Model</th>
</tr>
</thead>
<tbody>
<tr>
<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>
<td>Constituent satisfaction</td>
</tr>
<tr>
<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>
</tr>
<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>Stabiliy 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>

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. Describe the key elements of total quality.

8. 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.

9. Why is a customer focus a critical element of TQ?

10. Make a list of your personal “customers.” What steps might you take to understand their needs and remain “close” to them?

11. 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.

12. In what ways might the lack of top management leadership in a quality effort hinder or destroy it?

13. Explain the various areas within an organization in which continuous improvement and learning may take place.

14. Why is measurement important in a TQ effort?

15. 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?

16. Describe the three ways of viewing teamwork.

17. Describe some possible ways in which vertical, horizontal, and interorganizational teamwork can be applied at a college or university.

18. What does empowerment mean? How might an employee really know that he or she is truly empowered?

19. 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?

20. Explain the key differences between “traditional” management practices and those in a TQ environment.

21. 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.

22. How does TQ differ from agency theory?

23. Explain the mechanistic, organismic, and cultural models of organizations, and how TQ is similar to or different from them.

24. 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?

25. 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.

26. 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. While 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 con-
cept, 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 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 interna-
tional 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?

A Tale of Two Restaurants
Kelley’s Seafood Restaurant was founded about 15 years ago by Tim Kelley, who has run it from the start. The restaurant is very profitable because of its
excellent food quality, but lately has been having problems with consistency because of numerous suppliers. The restaurant operations are divided into front-end (servers) and back-end (kitchen). The kitchen has notes to boost employee morale, employees are cross-trained in all areas, and the kitchen staff continually seek improvements in cooking. Servers, however, have minimal wages and few perks, and turnover is a bit of a problem. Tim’s primary criterion for selecting servers is their ability to show up on time. There is little communication between the front-end and back-end operations, other than fulfilling orders. Tim makes sure that any complaints are referred to him immediately by the servers.

The restaurant has no automation, as Tim believes that it would get in the way of customers’ special requests. “This is the way we’ve done it for the past 15 years and how we will continue to do it,” was his response to a suggestion of using a computerized system to speed up orders and eliminate delays. Tim used to hold staff meetings regularly, but recently they have dropped from once each week to one every five or six months. Most of the time is spent focusing on negative behavior, and Tim has often said “You can’t find good people anymore.”

Jim’s SteakHouse is a family-owned restaurant in the same state. Jim uses only the freshest meats and ingredients from the best suppliers and gives extra large portions of food to customers, who feel they are getting their money’s worth. Jim pays his cooks high wages to attract quality employees. Servers get 70 percent of tips, bussers 20 percent, and the kitchen staff 10 percent to foster teamwork. Many new hires come from referrals from current employees. Jim interviews all potential employees and asks them many pointed questions relating to courtesy, responsibility, and creativity. The restaurant sponsors bowling nights, golf outings, picnics, and holiday parties for its employees. At Jim’s, birthday customers receive a free dinner, children are welcomed with balloons, candy, and crayons, and big-screen TVs cater to sports fans. Jim walks around and constantly solicits customer feedback. Jim visits many other restaurants to study their operations and learn new techniques. As a result of these visits, Jim installed computers to schedule reservations and enter orders to the kitchen.

Discussion Questions
1. Contrast these two restaurants from the perspective of TQ. What conclusions can you make and what advice would you give the owners?
2. What type of management model (mechanistic, organismic, or cultural) do you think each organization represents?

ENDNOTES

Chapter 1: Introduction to Total Quality in Organizations


7. Courtesy of Deer Valley Resort.


16. Based on personal communication from Roger Nunley, Director, Industry & Consumer Affairs, Coca-Cola, the Service Quality Survey, and the Industry & Consumer Affairs Department Overview.


29. Based on a student project prepared by Stacey Bizzell, Suzanne Lee, and Kenneth Shircliff. Their contribution is gratefully acknowledged.