Quality Advocates

Quality Advocates
Summary
Lessons Learned
Chapter Problems
Case Study 2.1  Quality and Ethics

Learning Opportunities:

1. To become familiar with seven quality masters
2. To understand the philosophies of quality management and continuous improvement
Most individuals are motivated to do the best they can. Sometimes though, the goal seems too far away and too hard to reach. The problem appears too big to tackle. How does a company deal with these issues? How can managers enable their employees to do their best? This chapter discusses total management and the quality advocates who have encouraged its use. Through effective management, companies can significantly improve their levels of quality, productivity, effectiveness, and customer and employee satisfaction.
QUALITY ADVOCATES

Many individuals have proclaimed the importance of quality. The seven discussed in this chapter are among the most prominent advocates. You’ll see that basic similarities exist among their ideas. Following a brief introduction to the seven men, we’ll look at the concept of total quality management and explain some of the similarities found in the philosophies of these leading professionals.

Dr. Walter Shewhart

Like most of us, Dr. Walter Shewhart (1891–1967) believed that we could make great decisions if we had perfect knowledge of the situation. However, life rarely provides perfect knowledge and who has time to wait for it anyway? Since work needs to be done and decisions need to be made, Dr. Shewhart developed statistical methods that can be used to improve the quality of the processes that provide goods and services. While working at Bell Laboratories in the 1920s and 1930s, Dr. Shewhart was the first to encourage the use of statistics to identify, monitor, and eventually remove the sources of variation found in repetitive processes. His work combined two aspects of quality: the subjective aspect, what the customer wants; and the objective side, the physical properties of the goods or services, including the value received for the price paid. He recognized that when translating customer requirements to actual products and services, statistical measures of key characteristics are important to ensure quality.

Dr. Shewhart identified two sources of variation in a process. Controlled variation, also termed common causes, is variation present in a process due to the very nature of the process. This type of variation can be removed from the process only by changing the process. For example, consider a person who has driven the same route to work dozens of times and determined that it takes about 20 minutes to get from home to work, regardless of minor changes in weather or traffic conditions. If this is the case, then the only way the person can improve upon this time is to change the process by finding a new route.

Uncontrolled variation, also known as special or assignable causes, comes from sources external to the process. This type of variation is not normally part of the process. It can be identified and isolated as the cause of a change in the behavior of the process. For instance, the commuter described in Chapter 1 would experience uncontrolled variation if a major traffic accident stopped traffic or a blizzard made traveling nearly impossible. Uncontrolled variation prevents the process from performing to the best of its ability.

It was Dr. Shewhart who put forth the fundamental principle that once a process is under control, exhibiting only controlled variation, future process performance can be predicted, within limits, on the basis of past performance. He wrote:

A phenomenon will be said to be controlled when, through the use of past experience, we can predict, at least within limits, how the phenomenon may be expected to vary in the future. Here it is understood that prediction within limits means that we can state, at least approximately, the probability that the observed phenomenon will fall within the given limits.*

Though he was a physicist, Dr. Shewhart studied process control through the use of charting techniques. Based on his understanding of variation and the belief that assignable causes of variation could be found and eliminated, Dr. Shewhart developed the formulas and table of constants used to create the most widely used statistical control charts in quality: the $\bar{X}$ and $R$ charts (Chapter 5 and Appendix 2). These charts (Figure 2.1) first appeared in a May 16, 1924 internal Bell Telephone Laboratories report. Later in his 1931 text, *Economic Control of Quality of Manufactured Product*, Dr. Shewhart presented the foundation principles upon which modern quality control is based.

In order to develop the charts, Dr. Shewhart first set about determining the relationship between the standard deviation of the mean and the standard deviation of the individual observations. He demonstrated the relationship by using numbered, metal lined, disk-shaped tags. From a bowl borrowed from his wife’s kitchen, he drew these...
tags at random to confirm the standard deviation of subgroup sample means is the standard deviation of individual samples divided by the square root of the subgroup size.

\[ s_x = \frac{s}{\sqrt{n}} \]

where

- \( s_x \) is the standard deviation of the mean (standard error)
- \( s \) is the standard deviation of individual observations
- \( n \) is the number of observations in each subgroup mean.

The control charts, as designed by Dr. Shewhart, have three purposes: to define standards for the process, to aid in problem-solving efforts to attain the standards, and to serve to judge if the standards have been met. These charts are covered in detail in Chapters 5, 6, 7, and 9. Although Dr. Shewhart concentrated his efforts on manufacturing processes, his ideas and charts are applicable to any process found in non-manufacturing environments.

Statistical process control charts are more than a tool. They provide a framework for monitoring the behavior of a process and provide a feedback loop that enables organizations to achieve dramatic process improvements. Since their introduction in 1931, Dr. Shewhart’s control charts have served to advance process improvement efforts in nearly every type of industry despite differing opinions about their appropriateness, applicability, limits derivations, sampling frequency, and use. It is a tribute to the ruggedness of Shewhart’s invention that they remain the preeminent statistical process control tool.

**Dr. W. Edwards Deming**

Dr. W. Edwards Deming (1900–1993) made it his mission to teach optimal management strategies and practices for organizations focused on quality. Dr. Deming encouraged top-level management to get involved in the process of creating an environment that supports continuous improvement. A statistician by training, Dr. Deming graduated from Yale University in 1928. He first began spreading his quality message shortly after World War II. In the face of American prosperity following the war, his message was not accepted in the United States. His work with the Census Bureau and other government agencies led to his eventual contacts with Japan as that nation was beginning to rebuild. There he helped turn Japan into an industrial force to be reckoned with. His efforts resulted in his being awarded the Second Order of the Sacred Treasure from the Emperor of Japan. It was only after his early 1980s appearance on the TV program “If Japan Can, Why Can’t We?” that Dr. Deming found an audience in the United States. Over time, he became one of the most influential experts on quality assurance.

Dr. Deming considered quality and process improvement activities as the catalyst necessary to start an economic chain reaction. Improving quality leads to decreased costs, fewer mistakes, fewer delays, and better use of resources, which in turn leads to improved productivity, which enables a company to capture more of the market, which enables the company to stay in business, which results in providing more jobs (Figure 2.2). He felt that without quality improvement efforts to light the fuse, this process would not begin.
Dr. Deming, who described his work as “management for quality,” felt that the consumer is the most critical aspect in the production of a product or the provision of a service. Listening to the voice of the customer and utilizing the information learned to improve products and services is an integral part of his teachings. To Dr. Deming, quality must be defined in terms of customer satisfaction. Such a customer focus means that the quality of a product or service is multidimensional. It also means that there are different degrees of quality; a product which completely satisfies customer A, may not satisfy customer B.

Dr. Deming’s philosophies focus heavily on management involvement, continuous improvement, statistical analysis, goal setting, and communication. His message, in the form of fourteen points, is aimed primarily at management (Figure 2.3). Dr. Deming’s philosophy encourages company leaders to dedicate themselves and their companies to the long-term improvement of their products or services. Dr. Deming’s first point—Create a constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business and to provide jobs—encourages leadership to accept the obligation to constantly improve the product or service through
innovation, research, education, and continual improvement in all facets of the organization. A company is like an Olympic athlete who must constantly train, practice, learn, and improve in order to attain a gold medal. Lack of constancy of purpose is one of the deadly diseases Dr. Deming warns about in his writings. Without dedication, the performance of any task can not reach its best. Dr. Deming’s second point—Adopt a new philosophy—that rejects “acceptable” quality levels and poor service as a way of life, supports continuous improvement in all that we do. The 12 other points ask management to rethink past practices, such as awarding business on the basis of price tag alone, using mass inspection, setting arbitrary numerical goals and quotas, enforcing arbitrary work time standards, allowing incomplete training or education, and using outdated methods of supervision. Mass inspection has limited value because quality cannot be inspected into a product. Quality can be designed into a product and manufacturing processes can produce it correctly; however, after it has been made, quality cannot be inspected into it. Similarly, awarding business on the basis of price tag alone is shortsighted and fails to establish mutual confidence between the supplier and the purchaser. Low-cost choices may lead to losses in productivity elsewhere.

Leadership, along with the concepts of authority and responsibility, plays a significant role in all Dr. Deming’s points. Without leadership, an organization and the people working within it are rudderless. Without effective leadership, the organization and its people cannot reach their full potential. Throughout his life, Dr. Deming encouraged leadership to create and manage systems that enable people to find joy in their work. Dr. Deming’s point about driving out fear stresses the importance of communication between leadership and management. Effective leaders welcome the opportunity to listen to their employees and act on valid suggestions and resolve key issues. Dr. Deming also points out the need to remove barriers that rob individuals of the right of pride in workmanship. Barriers are any aspect of a job that prevent employees from doing their jobs well. By removing them, leadership creates an environment supportive of their employees and the continuous improvement of their day-to-day activities. Improved management-employee interaction, as well as increased communication between departments, will lead to more effective solutions to the challenges of creating a product or providing a service. Education and training also play an integral part in Dr. Deming’s plan. Continual education creates an atmosphere that encourages the discovery of new ideas and methods. This translates to innovative solutions to problems. Training ensures that products and services are provided that meet standards established by customer requirements.

REAL TOOLS FOR REAL LIFE

Following Dr. Deming’s Teachings

KH Manufacturing makes components for the automotive industry. Unfortunately, several of the parts, due to design complexities, experienced numerous rejections from the customer. As a stopgap measure, KH instituted 100% inspection to minimize the chance of the customer receiving components that didn’t meet specifications. Scrap rates were high. Due to the complexities of the components, rework, typically, was not an option.
When products don’t live up to a customer’s expectations, customers shop elsewhere. The automotive customer, recognizing that they faced a high probability of receiving defective parts because 100% inspection is rarely 100% effective, began to “shop the work.”

At KH Manufacturing, costs associated with 100% inspection and manufacturing replacement components mounted. The thought of losing a customer disturbed them. KH recognized that Dr. Deming’s philosophy of “creating a constancy of purpose toward improvement of product and service” would enable them to keep the component job, become more competitive, stay in business, and provide jobs. Since 100% inspection is expensive and ineffective, KH wanted to enact process changes that would allow them to follow Dr. Deming’s third point and “cease dependence on inspection to achieve quality.”

Following Dr. Deming’s fifth point, “constantly and forever improve the system of production and service,” KH formed product improvement teams comprised of engineers and machine operators most closely associated with each component. Dr. Shewhart’s $\bar{X}$ and $R$ charts, recording process performance, formed the center of the improvement efforts.

The benefits of this approach to doing business were numerous. By “putting everyone in the company to work to accomplish the transformation,” a change came over the production line. As operators learned to use and understand the $\bar{X}$ and $R$ charts, they learned about their manufacturing processes. Process improvements, based on the knowledge gained from these charts, significantly improved component quality. Employee morale increased as they started to take an interest in their jobs. This was a big change for the union shop.

Changes happened on the individual level too. As management followed Dr. Deming’s seventh, sixth, and eighth points “institute leadership” by “instituting training on the job,” they were able to “drive out fear.” One operator, who originally was very vocal about not wanting to be on the team, eventually ended up as a team leader.

Unbeknownst to his coworkers, this operator faced a significant barrier that “robbed him of his right to pride of workmanship” (Dr. Deming’s 12th point). He had dropped out of school after sixth grade and had a very difficult time with math and reading. His understanding of math was so limited, he couldn’t understand or calculate an average or a range. To hide his lack of math skills, he memorized which keys to use on the calculator. As he attended classes offered by the company, he learned how to plot and interpret data in order to make process adjustments based on trends and out of control points. The more involved he became in the improvement efforts, the more he realized how interesting his work had become. His involvement with the team inspired him to go back to school and get his High School Graduate Equivalency Degree at the age of 55. He followed Dr. Deming’s 13th point, “institute a vigorous program of education and self-improvement.”

Rather than rely on “slogans, exhortations, and targets for the workforce,” KH Manufacturing followed Dr. Deming’s advice and eliminated “arbitrary work standards and numerical quotas.” KH was able to “cease dependence on inspection to achieve quality.” They “substituted leadership,” earning awards for being the most improved supplier. With their ability to manufacture complex components to customer specifications with nearly zero scrap, the plant has become the most profitable of the entire corporation.
Dr. Deming defined quality as “non-faulty systems.” At first glance this seems to be an incomplete definition, especially when compared to that of Dr. Feigenbaum. Consider, however, what is meant by a system. Systems enable organizations to provide their customers with products and services. Faulty systems cannot help but create faulty products and services, resulting in unhappy customers. By focusing attention on the systems that create products and services, Dr. Deming is getting at the heart of the matter.

Dr. Deming used the red bead experiment to help leaders understand how a process with problems can inhibit an individual’s ability to perform at his or her best. Dr. Deming used this experiment to create an understanding of his point—Remove barriers that rob people of their right to pride of workmanship. To conduct his experiment, Dr. Deming filled a box with 1000 beads, 800 white and 200 red. Participants randomly scooped 100 beads from the box. The participants have no control over which beads the scoop picked up or the percentage of red beads in the box. Given these constraints, 20% of the beads selected were red. Since only white beads are acceptable, Dr. Deming chastised those who scooped red beads from the box even though they have no control over their performance. Similarly, employees in an organization may often be blamed for faulty performance when in actuality it is the system that is faulty. The red beads represent problems in the system or process that can be changed only through leadership involvement. To Dr. Deming, it is the job of leaders to create non-faulty systems by removing the “red beads.”

Reducing the variation present in a system or process is one of the most critical messages Dr. Deming sent to leadership. To do this, he emphasized the use of the statistics and quality techniques espoused by Dr. Shewhart and covered in Chapters 3, 4, 5, 6, 7, and 9 in this text. According to Dr. Deming, process improvement is best carried out in three stages:

Stage 1: Get the process under control by identifying and eliminating the sources of uncontrolled variation. Remove the special causes responsible for the variation.

Stage 2: Once the special causes have been removed and the process is stable, improve the process. Investigate whether or not waste exists in the process. Tackle the common causes responsible for the controlled variation present in the process. Determine if process changes can remove them from the process.

Stage 3: Monitor the improved process to determine if the changes made are working.

Dr. Deming used a second experiment, the funnel experiment, to describes how tampering with a process can actually make the performance of that process worse. For this experiment, beads are dropped from a funnel over a target. During the experiment, the funnel is moved in three different ways. The reason for moving the funnel is to try to get the beads to cluster around the target, thus exhibiting very little variation in where they land. At first, the funnel is held stationary above the target, resulting in the pattern shown in Figure 2.4 under Rule 1. Next, the funnel is moved each time to where the bead landed on the previous trial, creating the pattern shown in Figure 2.4 under Rule 2. The third method requires that the funnel be moved in the opposite direction from where the bead from the previous trial lands. This results in the pattern...
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NOT AVAILABLE FOR ELECTRONIC VIEWING
shown in Figure 2.4 under Rule 3. Note that the smallest pattern, the one with the least amount of variation around the target, is the top one where the funnel is not moved. Using this experiment, Dr. Deming shows that tampering with a process, that is, moving the funnel actually increases the variation and results in poorer performance.

Tampering can be avoided by isolating and removing the root causes of process variation through the use of the Plan-Do-Study-Act (PDSA) problem-solving cycle.
When tackling process improvement, it is important to find the root cause of the variation. Rather than apply a Band-Aid sort of fix, when seeking the causes of variation in the process, Dr. Deming encouraged the use of the PDSA cycle (Figure 2.5). Originally developed by Dr. Walter Shewhart, the PDSA cycle is a systematic approach to problem-solving. During the Plan phase, users of the cycle study a problem and plan a solution. This should be the portion of the cycle that receives the most attention, since good plans lead to well-thought-out solutions. The solution is implemented during the Do phase of the cycle. During the Study phase, the results of the change to the process are studied. Finally, during the Act phase, when the results of the Study phase reveal that the root cause of the problem has been isolated and removed from the process permanently, the changes are made permanent. If the problem has not been resolved, a return trip to the Plan portion of the cycle for further investigation is undertaken. The PDSA cycle of problem-solving will be covered in detail in Chapter 3.

REAL TOOLS FOR REAL LIFE

Tampering with the Process

The Whisk Wheel Company has been notified by its largest customer, Rosewood Bicycle, Inc., that Whisk Wheel will need to dramatically improve the quality level associated with the hub operation. Currently the operation is unable to meet the specification limits set by the customer. Rosewood has been sorting the parts on the production line before assembly, but they want to end this practice. Figure 2.6 shows the product in question, a wheel hub. The hub shaft is made of chrome-moly steel. The dimension in question is the shaft length. The specification for the length is 3.750 ± 0.005 inch. The process involves taking 12 foot long chrome-moly steel shafts purchased from a supplier, straightening them, and cutting them to 3.750-inch length.
In order to determine the root causes of variation in hub length, the engineers are studying the cutting operation and the operator. The operator performs the process in the following manner. Every 18 minutes, he measures the length of six hubs. The length values for the six consecutively produced hubs are averaged, and the average is plotted on $\bar{X}$ and $\bar{R}$ charts. Periodically, the operator reviews the evolving data and makes a decision as to whether or not the process mean (the hub length) needs to be adjusted. These adjustments can be accomplished by stopping the machine, loosening some clamps, and jogging the cutting device back or forth depending on the adjustment the operator feels is necessary. This process takes about five minutes and appears to occur fairly often.

Based on the engineers’ knowledge of Dr. Deming’s funnel experiment, they are quick to realize that the operator is adding variation to the process. He appears to be over-controlling (over-adjusting) the process because he cannot distinguish between common cause variation and special cause variation. The operator has been reacting to patterns in the data that may be inherent (common) to the process. The consequences of this mistake are devastating to a process. Each time an adjustment is made when it is not necessary, variation is introduced to the process that would not be there otherwise. Not only is quality essentially decreased (made more variable) with each adjustment, but production time is unnecessarily lost.

Use Figure 2.7 to compare the differences in the charts when an adjustment is made or no adjustment is made to the process. Note that the process has stabilized because no unnecessary adjustments have been made. The method of over-control has proved costly from a quality (inconsistent product) and a productivity (machine downtime, higher scrap) point of view.

Systems thinking was a critical aspect of Dr. Deming’s work. He felt that all systems must have a specific goal to achieve. Clearly stating that goal will enable the people within the system to understand what they need to accomplish. By taking a systems approach, Dr. Deming hoped that people would understand that they are like an orchestra, seeking to blend their efforts together, to support each other, rather than play solos. Those taking the systems approach pay attention to the interactions between the parts. To be effective, an organization must manage the interactions between components in the system.

In his final book, The New Economics, Dr. Deming tied much of his life’s work together when he introduced the concept of profound knowledge. There are four interrelated parts of a system of profound knowledge:

- An appreciation for a system
- Knowledge of variation
- Theory of knowledge
- Psychology

Effective leaders have an appreciation for the systems that work together to create their organization’s products and services. They understand the interactions,
interrelationships, and flow of a complex system. Those who have an appreciation for a system create alignment between their customers’ needs, requirements, and expectations, the systems that produce products and services, and their organization’s purpose. Their efforts focus on improving these systems by using the PDSA problem-solving method to remove the system faults that result in errors.

Knowledge of variation means being able to distinguish between controlled and uncontrolled variation. First defined by Dr. Walter Shewhart, common or controlled variation is the variation present in a process or system due to its very nature. This natural variation can only be removed by changing the process or system in some way. Special cause variation, also known as uncontrolled variation, is the variation present in a process due to some assignable cause. This source of variation in a process can be readily identified and removed from the system or process. Significant process improvement comes from obtaining statistical knowledge about a process through control charting, the study of variation and the gathering and analysis of factual data.

The theory of knowledge involves using data to understand situations by being able to comprehend how people learn. Dr. Deming encouraged the use of fact-based information when making decisions. Effective leaders gather and analyze information for trends, patterns, and anomalies before reaching conclusions.

An understanding of psychology enables us to understand each other better, whether as customers or employees. By understanding people, their interactions and their intrinsic motivations, leaders can make better decisions.

Knowledge of all these areas enables companies to expand beyond small process-improvement efforts and to optimize systems in their entirety rather than sub-optimize only their parts. This type of systems thinking both requires and allows organizations to focus on the long term.

Dr. Deming’s influence continues today. Many of the concepts and ideas he espoused can be found in today’s continuous improvement programs and international standards. For example, the year 2000 revision of the international quality standard, ISO 9000, places significant emphasis on management involvement and responsibility, including communicating customer requirements, developing an integrated overall plan to support meeting customer requirements, measuring key product and service characteristics, ongoing training, and demonstrating leadership.

Living the continuous improvement philosophy is not easy. The level of dedication required to become the best is phenomenal. Dr. Deming warned against the “hope for instant pudding.” Improvement takes time and effort and does not happen instantly. The hope for instant pudding is one that afflicts us all. After all, how many of us wouldn’t like all our problems to be taken care of just wishing them away? Dr. Deming’s philosophies cover all aspects of the business, from customers to leadership to employees, and from products and services to processes. As evidenced by his 14th point—Put everyone in the company to work to accomplish the transformation—Dr. Deming’s quality system is really an ongoing process of improvement. To him, quality must be an integral part of how a company does business. Organizations must
continuously strive to improve; after all, the competition isn’t going to wait for them to catch up!

**Dr. Joseph M. Juran**

Born December 24, 1904, Dr. Joseph M. Juran (1904– ) immigrated from Romania to Minneapolis, Minnesota in 1912. In 1920, he enrolled in Electrical Engineering at the University of Minnesota. After earning his degree, he went to Western Electric as an engineer at the Hawthorne Manufacturing plant in Cicero, IL. There he served in one of the first inspection statistical departments in industry. During the Depression, he earned a law degree, just in case he needed an employment alternative. During World War II, he served in the Statistics, Requisitions, Accounts, and Control Section of the Lend-Lease administration. He was responsible for the procurement and leasing of arms, equipment, and supplies to WWII allies. Like Dr. Deming, Dr. Juran played a significant role in the rebuilding of Japan following WWII. Based on their work, both he and Deming were awarded the Second Order of the Sacred Treasure from the Emperor of Japan.

Dr. Juran’s approach involves creating awareness of the need to improve, making quality improvement an integral part of each job, providing training in quality methods, establishing team problem solving, and recognizing results. Dr. Juran emphasizes the need to improve the entire system. To improve quality, individuals in a company need to develop techniques and skills and understand how to apply them. Dr. Juran’s definition of quality goes beyond the immediate product or moment of service. To Dr. Juran, quality is a concept that needs to be found in all aspects of business. As shown in Figure 2.8, Dr. Juran contrasts big Q and little q to show the broad applicability of quality concepts.

During his career, Dr. Juran significantly influenced the movement of quality from a narrow statistical field to quality as a management focus. He attributes his change in emphasis to having read Margaret Mead’s book *Cultural Patterns and Technical Change*...
(first edition, UNESCO, 1955). The book describes how a clash of cultures leads to resistance to change, as demonstrated by resistance in developing nations to the United Nations efforts to improve conditions. Dr. Juran felt this resistance to change could also be seen in clashes between management and employees. His book, Managerial Breakthrough (McGraw-Hill, 1964), discusses cultural resistance and how to deal with it. He felt that managing for quality is an offshoot of general management but is a science in its own right. He followed this book with a trilogy that outlines three key components of managing for quality.

The Juran trilogy makes use of three managerial processes: Quality Planning, Quality Control, and Quality Improvement (Figure 2.9 and Table 2.1). By following Dr. Juran’s approach, companies can reduce the costs associated with poor quality and remove chronic waste from their organizations. Quality Planning encourages the development of methods to stay in tune with customers’ needs and expectations. Quality Control involves comparing products produced with goals and specifications. Quality Improvement involves the ongoing process of improvement necessary for the company’s continued success.

In his text Juran on Leadership for Quality: An Executive Handbook, Dr. Juran puts forth three fundamental tenets: upper management leadership, continuous education, and annual planning for quality improvement and cost reduction. Dr. Juran discusses the importance of achieving world-class quality by identifying the need for improvement, selecting appropriate projects, and creating an organizational structure that guides the diagnosis and analysis of the projects. Successful improvement efforts
encourage breakthroughs in knowledge and attitudes. The commitment and personal leadership of top management must be assured in order to break through cultural resistance to change.

In the project-by-project implementation procedure (Table 2.2), project teams are set up to investigate and solve specific problems. To guide the project teams, the Juran program establishes a steering committee. The steering committee serves three purposes: to ensure emphasis on the company's goals, to grant authority to diagnose and investigate problems, and to protect departmental rights.

The project teams should be composed of individuals with diverse backgrounds. Diversity serves several purposes. It allows for a variety of viewpoints, thus avoiding preconceived answers to the problem. Having a diversified group also aids in implementing the solutions found. Group members are more willing to implement the solution because they have a stake in the project. The different backgrounds of the group members can also assist in breaking down the cultural resistance to change.

Juran's project teams are encouraged to use a systematic approach to problem solving. Group members use a variety of investigative tools to clarify the symptoms and locate the true cause(s) of the problem. When the cause is determined, finding a solution becomes a process of proposing remedies, testing them, and instituting the remedy that most effectively solves the problem. Controlling the process once changes have been made is important to ensure that the efforts have not been wasted. Improvements continue as the groups study and resolve other problems.

Still active at 100 years of age, in an interview with Quality Progress magazine May 2004, Dr. Juran had this advice for people: “become bilingual; learn to communicate
with senior managers by converting quality data into the language of business and finance.” He is referring to the need to state quality goals in financial terms so that they can enhance the organization’s overall business plan.

Dr. Armand Feigenbaum

Armand Feigenbaum (1920– ) is considered to be the originator of the total quality movement. As stated in Chapter 1, Dr. Feigenbaum defined quality based on a customer’s actual experience with the product or service. He wrote his landmark text, Total Quality Control, while he was still in graduate school at the Massachusetts Institute of Technology. Since its publication in 1951, it has been updated regularly and remains a significant influence on today’s industrial practices. In his text, he predicted that
quality would become a significant customer-satisfaction issue, even to the point of surpassing price in importance in the decision-making process. As he predicted, consumers have come to expect quality to be an essential dimension of the product or service they are purchasing.

To Dr. Feigenbaum, quality is more than a technical subject; it is an approach to doing business that makes an organization more effective. He has consistently encouraged treating quality as a fundamental element of a business strategy. In his article “Changing Concepts and Management of Quality Worldwide,” from the December 1997 issue of Quality Progress, he asserts that quality is not a factor to be managed but a method of “managing, operating, and integrating the marketing, technology, production, information, and finance areas throughout a company’s quality value chain with the subsequent favorable impact on manufacturing and service effectiveness.” According to Dr. Feigenbaum, management is responsible for recognizing the evolution of the customer’s definition of quality for their products and services. Quality systems are a method of managing an organization to achieve higher customer satisfaction, lower overall costs, higher profits, and greater employee effectiveness and satisfaction. Company leadership is responsible for creating an atmosphere that enables employees to provide the right product or service the first time, every time. Dr. Feigenbaum encourages companies to eliminate waste, which drains profitability, by determining the costs associated with failing to provide a quality product (see Chapter 12). Quality efforts should emphasize increasing the number of experiences that go well for a customer versus handling things when they go wrong. Statistical methods and problem-solving techniques should be utilized to effectively support business strategies aimed at achieving customer satisfaction. In its newest edition, his text serves as a how-to guide for establishing a quality system.

Philip Crosby

Philip Crosby’s (1926–2001) message to management emphasizes four absolutes (Figure 2.10). The four absolutes of quality management set expectations for a continuous improvement process to meet. The first absolute defines quality as conformance to requirements. Crosby emphasizes the importance of determining customer requirements, defining those requirements as clearly as possible, and then producing products or providing services that conform to the requirements as established by the customer. Crosby felt it necessary to define quality in order to manage quality. Customer requirements must define the products or services in terms of measurable characteristics.

Prevention of defects, the second absolute, is the key to the system that needs to be in place in order to ensure that the products or services provided by a company
meet the requirements of the customer. Prevention of quality problems in the first
place is much more cost-effective in the long run. Determining the root causes of de-
fects and preventing their recurrence are integral to the system.

According to Crosby, the performance standard against which any system must be
judged is zero defects. This third absolute, **zero defects**, refers to **making products cor-
rectly the first time, with no imperfections**. Traditional quality control centered on final
inspection and “acceptable” defect levels. Systems must be established or improved
that allow the worker to do it right the first time.

His fourth absolute, **costs of quality**, are the costs associated with providing cus-
tomers with a product or service that conforms to their expectations. Quality costs, to be
discussed in more detail in Chapter 12, are found in prevention costs; detection
costs; costs associated with dissatisfied customers; rework, scrap, downtime, and ma-
terial costs; and costs involved anytime a resource has been wasted in the produc-
tion of a quality product or the provision of a service. Once determined, costs of
quality can be used to justify investments in equipment and processes that reduce
the likelihood of defects.

In several of his books, Crosby discusses the concepts of a successful customer ver-
sus a satisfied customer. To him, a successful customer is one who receives a product or
service which meets his or her expectations the first time. When a customer is merely
satisfied, steps may have to have been taken to rework or redo the product or service
until the customer is satisfied, for instance, a diner who receives an overcooked piece
of meat and then insists that the meal be taken off his or her bill. In the action of sat-
sifying a customer whose expectations were not met the first time, the company has
incurred quality costs.

In some circumstances, quality may seem intangible. By discussing five erroneous
assumptions about quality, Crosby attempts to make quality more understandable and
tangible. The first erroneous assumption, quality means goodness, or luxury, or shini-
ness, or weight, makes quality a relative term. Only when quality is defined in terms
of customer requirements can quality be manageable. The second incorrect assump-
tion about quality is that quality is intangible and therefore not measurable. If judged
in terms of “goodness,” then quality is intangible; however, quality is measurable by
the cost of doing things wrong. More precisely, quality costs involve the cost of fail-
ures, rework, scrap, inspection, prevention, and loss of customer goodwill.

Closely related to the first two assumptions is the third, which states that there ex-
ists “an economics of quality.” Here again, one errs in thinking that quality means
building “luxuries” into a product or service; rather, quality means that it is more eco-
nomical to do things right the first time.

Often workers are blamed for being the cause of quality problems. This is the
fourth erroneous assumption about quality. Without the proper tools, equipment,
and raw materials, workers cannot produce quality products or services. Management
must ensure that the necessary items are available to allow workers to perform their
jobs well.

The final erroneous assumption that Crosby discusses is that quality originates in
the quality department. According to Crosby, the quality department's responsibilities
revolve around educating and assisting other departments in monitoring and improving quality.

Crosby’s quality management philosophy supports creating a greater understanding of the complexities of managing an organization. Much of his focus was on simplifying the concepts surrounding the definition of quality and the need to design systems that support the concept of producing products or supplying services containing zero defects.

Dr. Kaoru Ishikawa

One of the first individuals to encourage total quality control was Dr. Kaoru Ishikawa (1915–1989). Dr. Ishikawa, a contemporary of Dr. Deming and Dr. Juran, transformed their early teachings into the Japanese approach to quality. Because he developed and delivered the first basic quality control course for the Union of Japanese Scientists and Engineers (JUSE) in 1949 and initiated many of Japan’s quality programs, he is considered the focus of the quality movement in Japan. Dr. Ishikawa is also credited with initiating quality circles in 1962. Like Dr. Deming and Dr. Juran, his devotion to the advancement of quality merited him the Second Order of the Sacred Treasure from the Emperor of Japan.

To Dr. Ishikawa, quality must be defined broadly. Attention must be focused on quality in every aspect of an organization, including the quality of information, processes, service, price, systems, and people. He played a prominent role in refining the application of different statistical tools to quality problems. Dr. Ishikawa felt that all individuals employed by a company should become involved in quality problem solving. He advocated the use of seven quality tools: histograms; check sheets; scatter diagrams; flowcharts; control charts; Pareto charts; and cause-and-effect, or fish-bone, diagrams. These tools, shown in Figure 2.11, are covered in detail in Chapter 3. Dr. Ishikawa developed the cause-and-effect diagram in the early 1950s. This diagram, used to find the root cause of problems, is also called the Ishikawa diagram, after its creator, or the fish-bone diagram, because of its shape.

Dr. Ishikawa promoted the use of quality circles, teams that meet to solve quality problems related to their own work. The quality circle concept has been adapted and modified over time to include problem-solving team activities. Membership in a quality circle is often voluntary. Participants receive training in the seven tools, determine appropriate problems to work on, develop solutions, and establish new procedures to lock in quality improvements.

In order to refine organizations’ approach to quality, Dr. Ishikawa encouraged the use of a system of principles and major focus areas as a holistic way to achieve business performance improvement. Customers and the processes that fulfill their needs, wants, and expectations were critical to Dr. Ishikawa. He felt that a focus on customer-oriented quality would break down the functional barriers that prevent the creation of defect-free products. In order to do this, processes should be analyzed from the viewpoint of the customer. As quoted in Quality Progress, April 2004, like others in the field, he felt that “Quality should not be interpreted in the narrow
sense but interpreted broadly, including price, delivery and safety, to satisfy consumer's needs."

As presented in Quality Progress, April 2004, his system includes six fundamentals which form the Japanese quality paradigm:

1. All employees should clearly understand the objectives and business reasons behind the introduction and promotion of company-wide quality control.
2. The features of the quality system should be clarified at all levels of the organization and communicated in such a way that the people have confidence in these features.

3. The continuous improvement cycle should be continuously applied throughout the whole company for at least three to five years to develop standardized work. Both statistical quality control and process analysis should be used, and upstream control for suppliers should be developed and effectively applied.

4. The company should define a long-term quality plan and carry it out systematically.

5. The walls between departments or functions should be broken down, and cross-functional management should be applied.

6. Everyone should act with confidence, believing his or her work will bear fruit.

The system also includes four major focus areas designed to influence quality through leadership:

1. **Market-in quality:** Leadership should encourage efforts that enable the organization to determine external customer needs, wants, requirements and expectations. By focusing on these elements and designing processes to deliver value to the market, an organization can increase its business competitiveness.

2. **Worker involvement:** Quality improvement through the use of cross-functional teams enhances an organization’s ability to capture improvements to the work processes. Appropriate training in problem-solving tools and techniques is a must.

3. **Quality Begins and Ends with Education:** Education enhances an individual’s ability to see the big picture. Education creates a deeper understanding of the activities that must take place in order for the organization to be successful.

4. **Selfless Personal Commitment:** Dr. Ishikawa lived his life as an example of selfless personal commitment. He encouraged others to do likewise, believing that improving the quality of the experience of working together helps improve the quality of life in the world.

Point 4 above summarizes Dr. Ishikawa’s tireless, lifelong commitment to furthering the understanding and use of quality tools in order to better the processes that provide products and services for customers.

**Dr. Genichi Taguchi**

Dr. Genichi Taguchi (1924– ) developed methods that seek to improve quality and consistency, reduce losses, and identify key product and process characteristics before production. Dr. Taguchi’s methods emphasize consistency of performance and significantly reduced variation. Dr. Taguchi introduced the concept that the total loss to society generated by a product is an important dimension of the quality of a product. In his “loss function” concept, Dr. Taguchi expressed the costs of performance variation (Figure 2.12). Any deviation from target specifications causes loss, he said, even if the variation is within specifications. When the variation is within
specifications, the loss may be in the form of poor fit, poor finish, undersize, oversize, or alignment problems. Scrap, rework, warranties, and loss of goodwill are all examples of losses when the variation extends beyond the specifications. Knowing the loss function helps designers to set product and manufacturing tolerances. Capital expenditures are more easily justified by relating the cost of deviations from the target value to quality costs. Minimizing losses is done by improving the consistency of performance.

Dr. Taguchi is also known for his work in experiment design. Statistically planned experiments can identify the settings of product and process parameters that reduce performance variation. Dr. Taguchi's methods design the experiment to systematically weed out a product's or process's insignificant elements. The focus of experiment efforts is then placed on the significant elements. There are four basic steps:

1. Select the process/product to be studied.
2. Identify the important variables.
3. Reduce variation on the important variables through redesign, process improvement, and tolerancing.
4. Open up tolerances on unimportant variables.

The final quality and cost of a manufactured product are determined to a large extent by the engineering designs of the product and its manufacturing process.

SUMMARY

Many different definitions of quality exist, as do many different methods of achieving quality. Similarities exist between each of the advocates presented in this chapter. Many of the quality improvement techniques presented in this text have their foundation in the teachings of one or more of these men. The two most prominent men in the field of quality, Dr. Deming and Dr. Juran, were contemporaries, both
crusading for quality improvement. Both of them, as well as Dr. Crosby agree that problems originate in the system, not the worker. All recognize that problems can only be solved through top management leadership and problem-solving techniques, not colorful banners and slogans. Dr. Deming focused more on applying statistical methods as a remedy for quality problems, where Dr. Juran’s experiences lead him to believe that managing for quality is vital. Figure 2.13 briefly summarizes each quality advocate’s definition of quality as well as what he is best known for.

### Lessons Learned

1. Dr. Shewhart developed statistical process control charts as well as the concepts of controlled and uncontrolled variation.
2. Dr. Deming is known for encouraging companies to manage for quality by defining quality in terms of customer satisfaction.
3. Dr. Deming created his fourteen points as a guide to management.
4. Dr. Juran’s process for managing quality includes three phases: quality planning, quality control, and quality improvement.
5. Dr. Feigenbaum defined quality as “a customer determination which is based on the customer's actual experience with the product or service, measured against his or her requirements—stated or unstated, conscious or merely sensed, technically operational or entirely subjective—always representing a moving target in a competitive market.”
6. Crosby describes four absolutes of quality and five erroneous assumptions about quality.
7. To Crosby, there is a difference between a successful customer and one who is merely satisfied.
8. Dr. Ishikawa encouraged the use of the seven tools of quality, including the one he developed: the cause and effect diagram.
9. Dr. Taguchi is known for his loss function describing quality and his work in the area of design of experiments.

Chapter Problems

1. Describe the three purposes of Dr. Shewhart’s control charts.
2. How do Dr. Deming's 14 points interact with each other?
3. Which point from Dr. Deming's 14 points do you agree with the most strongly? Why?
4. Which of Dr. Deming's 14 points do you have a hard time understanding? Why do you think that is?
5. Describe a situation you have experienced where one of Dr. Deming's 14 points applies. Clearly state the point you are referring to. Clearly show how the point relates to your own experience.
6. Dr. Juran presented a concept he called Big Q, Little q. Describe the difference between Big Q and Little q.
7. Describe Dr. Juran's approach to quality improvement.
8. How do the steering/diagnostic arms of Dr. Juran’s program work together?
9. a. What is Crosby's definition of quality?
   b. Explain Crosby's system of quality.
   c. What is Crosby's performance standard?
   d. Why do you believe this can or cannot be met?
10. What did Crosby mean when he discussed the difference between satisfied customers and successful customers?
11. People tend to make five erroneous assumptions about quality. What are two of these assumptions and how would you argue against them? Have you seen one of Crosby's erroneous assumptions at work in your own life? Describe the incident(s).
12. What follows is a short story about a worker who has requested additional education and training. Read the story and discuss which point or points
of Dr. Deming’s, Dr. Juran’s, and Crosby’s philosophies are not being followed. Cite at least one point from each man’s plan. How did you reach your conclusions? Back up your answers with statements from the story. Support your argument.

Inspector Simmons has been denied permission to attend an educational seminar. Although Simmons has attended only one training course for plumbing inspectors in his 15 years on the job, he will not be permitted to attend a two-week skills enhancement and retraining session scheduled for the coming month. The course devotes a significant amount of time to updating inspectors on the new plumbing regulations. While the regulations concerning plumbing have changed dramatically in the past five years, this is the third request for training in recent years that has been denied.

City commissioners have voted not to send Simmons for the $1,150 course, even though the plumbing guild has offered to pay $750 of the cost. The commissioners based their decision on a lack of funds and a backlog of work resulting from stricter plumbing standards enacted earlier this year. City commissioners do not believe that Simmons’s two-week salary should be paid during the time that he is “off work.” They also feel that the $400 cost to the city as well as travel expenses are too high. Although the city would benefit from Simmons’s enhanced knowledge of the regulations, one city official was quoted as saying, “I don’t think he really needs it anyway.”

The one dissenting city commissioner argued that this is the first such course to be offered covering the new regulations. She has said, “Things change. Materials change. You can never stop learning, and you can’t maintain a quality staff if you don’t keep up on the latest information.”

13. Briefly summarize the concept Dr. Taguchi is trying to get across with his loss function.

14. Describe Dr. Taguchi’s loss function versus the traditional approach to quality.

15. Research Dr. Deming’s “red bead” experiment. What does it show people?

16. Research Dr. Deming’s funnel experiment. What is the experiment trying to show people?

17. Research Dr. Deming’s profound knowledge system. What are its components? How do they work together? Describe each component’s critical concept.
CASE STUDY 2.1
Quality and Ethics

In this chapter, the issues of commitment, involvement, motivation, responsibility, authority, training, education, and communication were discussed as they relate to quality in all aspects of a company. The following article presents a disastrous situation that could have been avoided had the principles of TQM been applied.

THE QUALITY-ETHICS CONNECTION*

There is a generalized and widespread perception that the United States is suffering from moral malaise—a breakdown in ethics that has pervaded every corner and stratum of society.

Signposts of this breakdown are everywhere. The current generation in power wrestles ineffectually with the problems it faces, such as hunger, poverty, environmental degradation, urban decay, the collapse of economic systems, and corruption in business and government.

This moral malaise is infecting U.S. institutions at the highest levels. Along with murderers, rapists, muggers, and thieves, there are religious leaders, political leaders, banking officials, and other business executives being carted off to jail.

A younger generation is questioning at a very early age whether it is realistic to expect morality in contemporary society. The answer to this question—and possibly a solution to this dilemma—can be found in the cross-application of quality management theory and the realm of ethics. There is a striking similarity between the issues Americans are facing in ethics and the issues that quality professionals are facing in U.S. businesses.

Ethical Base Not at Fault

In many ways, the apparent decline in individuals’ and institutions’ ethical behavior parallels the now well-understood decline in global competitiveness of the nation’s industrial base. The United States became the world’s role model in part because of a political system that recognized, for the first time in human history, the importance of individual rights and responsibilities in maintaining a free (and moral) society. Yet there is now a growing frustration among Americans because their ability to exercise those rights and responsibilities has been seriously impaired.

*This article by Marion W. Steeples, president of Resources for Quality, Denver, Colorado, appeared in the June 1994 issue of Quality Progress, the journal of the American Society for Quality, and is reproduced here with the permission of the Society.
Many people attribute the moral crisis problem to a breakdown in the ethical character of too many individuals within the society. They often cite the decline of the nuclear family, increased tolerance for alternative lifestyles, drug and alcohol abuse, disrespect for authority, or some other lapse of traditional values as the source of the malaise.

Yet, if the public were surveyed on their ethical beliefs, the results would likely show that, overall, Americans hold moral beliefs similar in most respects to those of their parents and grandparents. While some of the particulars of what constitutes moral behavior might have changed, Americans still hold to a personal ethic that emphasizes honesty, personal responsibility, tolerance, and good citizenship.

So the question becomes: If personal ethics have not substantially changed, what is the source of the ethical breakdown? The national rhetoric about ethics has overtones of despair in it; there is a belief that the individual has somehow lost the will to act ethically. Solutions tend to center on the need to indoctrinate students, from the earliest ages through college, in the finer points of their civic and ethical responsibilities.

This is a familiar tune to quality professionals. In U.S. factories, employees are repeatedly called to account for every sort of problem when, in fact, the source of the problem is not the employees or a department, but the system itself. A typical response to problems is exhorting employees to work harder, more diligently, and with greater care and attention to detail. The implication is that employees don’t care about the outcome of their work.

To the contrary, employees typically come to work with the intention of doing the best job possible but are stymied and discouraged at every level in the system. Employees are consistently prevented from doing the right things by systems that discourage individual initiative, improved efficiency, and improved quality.

What if America’s so-called “ethical crisis” were the result of similar structural deficiencies? What if the crisis were simply a matter of societal structures that do not support and sustain ethical behavior?

**Societal and Corporate Structures**

In my work as a quality practitioner and an examiner for the Malcolm Baldrige National Quality Award, I have seen a strong correlation between quality and ethics. Quality is the standard by which Americans measure the goods and services they value. Ethics is the standard by which Americans measure their own behavior and that of institutions.

In virtually every case, when a company improved quality, ethics also improved. This was evident not only in the employees’ actions (e.g., decreased absenteeism, decreased internal thefts, and increased participation), but also in the company’s actions (e.g., examining such conceptual problems as defining corporate purpose, introducing long-term thinking and integrated planning, and determining internal and external customers’ needs and acting on those needs). These improvements occurred merely as a latent benefit of quality improvement. Improved ethics was rarely a stated
goal of the quality improvement programs when they were initiated. Yet the benefit is real and universal.

The Great Chicago Flood

The Chicago flood of 1992 is a classic example of how a system breakdown resulted in what is typically attributed to individual moral lapses. In mid-April 1992, the Chicago River broke through a crack in a tunnel beneath the Chicago Loop's business district, and businesses in the nation's third largest city came to a halt. Water snaked through the 50-mile labyrinth of century-old freight tunnels, and 250 million gallons rushed into commercial-area basements. Electrical power was shut off to avert the possibility of explosions from transformers shorting out. More than 200,000 people were evacuated, and more than 120 buildings were dark for two days.

To stem the tide, crews labored around the clock drilling holes and plugging them with concrete. It took more than two weeks for the U.S. Army Corps of Engineers to drain the water.

This devastating underground flood took a heavy toll. The Chicago Board of Trade shut down, hampering worldwide trading, with crippling economic effects. City Hall, several office towers, and many retailers were closed. Fifteen buildings were unable to operate for at least a week. Estimates put the price tag of this snafu at $1.7 billion.

The irony is that, for an estimated $10,000, the disaster could have been prevented. On Jan. 14, 1992, two cable TV workers discovered a 20-foot-by-6-foot crack in the tunnel. Standing knee deep in water and mud, the crew videotaped the event, recording “This is a cave-in!”

The cable TV crew, however, had trouble finding the correct city government official to which they could report the incident—the local government was in the midst of a major reorganization to increase efficiency.

In late February, the cable TV workers were finally able to discuss the situation with the appropriate city official; they urged that the tunnel site be inspected. But when they talked to the city official again on March 2, they learned that little had been done. Finally, a city worker led an inspection, took photographs of the subterranean leak, and then waited a week for a drugstore to develop the prints.

On April 2, the city's bridge engineer sent a memo urging immediate action to his superior, the acting transportation commissioner. Two bids were obtained to repair the crack, but both were turned down in an attempt to get a lower price. It was business as usual.

On April 13, the tunnel burst. On April 14, the governor of Illinois declared Chicago a disaster area.

The city's response was predictable: Heads rolled in an effort to assign blame to individuals within the system. On April 15, Chicago's mayor fired the acting commissioner. Subsequently, an engineer was discharged and five others were disciplined. The city blamed individuals in the system without addressing the structural problems that made such a debacle possible in the first place. Yet, from a quality viewpoint, the system's inefficiencies are immediately apparent.
How Chicago Went Wrong

Like many traditional U.S. corporations, the city of Chicago suffered from structural problems generated by the specialization of functions and a horizontal management structure that made individual initiative to take positive action next to impossible. As quality slips through the functional cracks of these outmoded systems, ethics are not far behind. Any system that values efficiency over effectiveness also devalues ethical behavior.

Unfortunately, for the individual citizen or bureaucrat who still attempts to behave ethically, the fragmentation of the structures that make up an organization, such as a large city government, makes taking action difficult, if not impossible.

Before history has made its final judgment on the Chicago flood, it behooves those within the quality profession to point out that the emperor had no clothes on. Far from being assignable to the incompetence of one or more city employees, the disaster that overtook downtown Chicago was the obvious—and predictable—result of the fragmentation of the city's organizational structure.

Chicago was not acting as one organization but as many—each one with its own set of rules, agenda, and rewards for success. No individual within those separate departments has a stake in the final outcome, only a stake in his or her part.

The Chicago flood dramatizes what is the rule and not the exception in most U.S. organizations, public or private. Whenever there is a break in responsibilities and accountabilities, there is no structural way to ensure that responsible, ethical actions will result. To the contrary, the system in Chicago consistently frustrated every attempt by individuals to behave ethically.

What Could Have Made It Right?

For openers, the organization needed clearer direction and goals. The city government needed to build its structure based on these goals to ensure that connections within and between the departments and agencies were sound. These human connections work well only if an integrated organizational structure that aligns functions is in place.

When each department stands alone, the support needed to enable employees to do the right thing is nonexistent. Employees cannot be expected to continually and repeatedly go to heroic measures simply to perform their jobs. Some people can't do it; they simply don't know how to maneuver around the system. Others won't do it; it's simply too hard and asks too much, and the rewards of bucking the system are dubious. A faulty system can make employees powerless to make positive contributions. There are simply too many barriers.

It is important to reiterate that, at every stage in the flood fiasco, attempts were made to act ethically. The cable TV crew recognized the problem and attempted to notify the appropriate authorities, but the news was not quickly relayed or responded to. The various levels of engineers attempted to solve the problem, but they couldn't break through the layers of bureaucracy in time. Like the crumbling concrete in the tunnel, the decades-old policies and procedures became deadly impediments to the
exercise of good judgment. The deluge of water that stopped downtown Chicago served only to mark the beginning of the challenging road that now lies before it and every city government. The old system is inadequate and, as thousands of Chicago residents can attest, the results have been disastrous.

The dollar cost for correcting things gone wrong, as in the Chicago flood, takes a heavy toll on the taxpayers. Moreover, there is the toll of disillusionment and a loss of trust, as was witnessed in the savings-and-loan debacle, in which the old system of checks and balances collapsed completely.

How Can Americans Make a Change?

Chicago's century-old tunnel system was once used to carry freight; now it carries electronic and communications gear. A system that once helped Chicago be productive is now a problem. Unfortunately, Chicago's situation represents business as usual in much of America. The organizational structures that Americans created during the industrial age don't always translate well in the information age. An earlier age of specialization has led to the current age of frustration.

Out of seemingly separate movements, quality and ethics have emerged as top issues in the national agenda. The issue of quality has been forced by economic reality: In a global economy, quality-leveraged companies are simply more competitive. Quality, in other words, provides a system for living up to the expectations and addressing the needs of customers.

In a strikingly similar fashion, the issue of ethics has emerged out of a sense that the United States' long-standing reputation as the model of democracy and as a moral force in the world has eroded. Americans consider themselves a moral people, dedicated to the high ideals laid out in such documents as the Constitution and Bill of Rights.

But citizens from Los Angeles, CA, to Washington, DC, are grappling with the apparent inability of U.S. systems to live up to their ethical expectations or to reasonably address their legitimate needs. They feel helpless when dealing with institutions that seem out of touch with reality and that don't have an innate sense of right and wrong. Such frustrations have grown beyond “big government” and “big industry.” People encounter unresponsive, apparently amoral systems daily in such places as local public schools, grocery stores, doctors' offices, and banks.

The old systems make it difficult at best and impossible at worst for institutions to live up to their ethical expectations and to address Americans' legitimate needs. Thus, new systems need to be created—and that is where total quality management (TQM) comes in.

TQM provides a model for systematically creating responsive societal structures. It can build individual responsibility and initiative back into impervious and rigid systems. Reconfigured systems, based on a solid foundation of vision and purpose, ensure that rational, long-term thinking, rather than expediency, guides organizational decisions.

TQM offers a systematic way for organizations to link values and value. Experience shows that total quality companies are successful because they translate what customers
value into quality requirements and practices. In that context, ethics can be viewed simply as a primary set of customer values. Creating ethical systems is a matter of building ethical expectations into systems and providing support to employees so that they can live up to those expectations.

By integrating the functions of an organization and by connecting quality and ethics, institutions can provide what is of value to customers and provide what is valuable to society. They must ensure the integrity of systems (quality) and the integrity of people (ethics). The absence of one affects the other.

TQM has proven itself as a way to rebuild infrastructure by integrating and aligning operations to provide value. But the paradox is that, inasmuch as quality systems can assist Americans’ search for continued ethical improvement, quality itself is not possible without ethics. Quality theory provides a means for integrating systems to provide value. But only an ongoing discussion of ethics will provide a notion of what is meant by “value.”

Assignment

1. Discuss how the specific issues of communication, responsibility, authority, commitment, and motivation relate to quality in all aspects of a company’s operation.
2. Discuss quality issues as they pertain to the Chicago incident. To organize your discussion, consider the following questions:
   - Who is management in this instance?
   - What was their level of commitment and involvement?
   - How were they at motivating employees?
   - Who had the responsibility?
   - Who had the authority?
   - Were the employees appropriately educated and trained?
   - Why did communication break down?