
Chapter 14

Quality Management Systems

For more than two decades “quality” and “quality management systems” have been leading buzzwords in the business world. Numerous consultants have built their careers around these topics, and quality issues in business have been responsible for the development of new organizations and even industries, for instance, the American Society for Quality and Six Sigma consulting.

The notion of quality in business focuses on the savings and additional revenue that organizations can realize if they eliminate errors throughout their operations and produce products and services at the optimal level of quality desired by their customers. Errors can take almost any form—for example, producing the wrong number of parts, sending bank statements to customers who have already closed their accounts or sending an incorrect bill to a client. All of these errors are very common, and the costs incurred seem minimal. But over time when mistakes are repeated the costs add up to a significant amount, so eliminating errors can result in significant increases to the bottom line of a business.

WHAT IS QUALITY?

According to the American Society for Quality, “quality” can be defined in the following ways:

- ✓ Based on customer’s perceptions of a product/service’s design and how well the design matches the original specifications.
- ✓ The ability of a product/service to satisfy stated or implied needs.
- ✓ Achieved by conforming to established requirements within an organization.

What Is a Quality Management System?

A quality management system is a management technique used to communicate to employees what is required to produce the desired quality of products and services and to influence employee actions to complete tasks according to the quality specifications.

What Purpose Does a Quality Management System Serve?

- ✓ Establishes a vision for the employees.
- ✓ Sets standards for employees.
- ✓ Builds motivation within the company.
- ✓ Sets goals for employees.
- ✓ Helps fight the resistance to change within organizations.
- ✓ Helps direct the corporate culture.

Why Is Quality Important?

Business success may simply be the extent to which your organization can produce a higher-quality product or service than your competitors are able to do at a competitive price. When quality is the key to a company’s success, quality management systems allow organizations to keep up with and meet current quality levels, meet the consumer’s

requirement for quality, retain employees through competitive compensation programs, and keep up with the latest technology.

HISTORY OF THE QUALITY MOVEMENT

As early as the 1950s, Japanese companies began to see the benefits of emphasizing quality throughout their organizations and enlisted the help of an American, W. Edwards Deming, who is credited with giving Japanese companies a massive head start in the quality movement. His methods include statistical process control (SPC) and problem-solving techniques that were very effective in gaining the necessary momentum to change the mentality of organizations needing to produce high-quality products and services. Deming developed his 14 points (Appendix 14.1) to communicate to managers how to increase quality within an organization.

Deming believed that 85 percent of all quality problems were the fault of management. In order to improve, management had to take the lead and put in place the necessary resources and systems. For example, consistent quality in incoming materials could not be expected when buyers were not given the necessary tools to understand quality requirements of those products and services. Buyers needed to fully understand how to assess the quality of all incoming products and services, understand the quality requirements, as well as be able to communicate these requirements to vendors. In a well-managed quality system, buyers should also be allowed to work closely with vendors and help them meet or exceed the required quality requirements.

According to Deming, there were two different concepts of process improvement that quality systems needed to address: (1) common (systematic) causes of error, and (2) special causes of error. Systematic causes are shared by numerous personnel, machines, or products; and special causes are associated with individual employees or equipment. Systematic causes of error include poor product/service design, materials not suited for their use, improper bills of lading, and poor physical conditions. Special causes of error include lack of training or skill, a poor lot of incoming materials, or equipment out of order.

Another influential individual in the development of quality control was Joseph M. Juran, who, like Deming, made a name for himself working in Japanese organizations focusing on improving quality. Juran also established the Juran Institute in 1979; its goals and objectives were centered on helping organizations improve the quality of their products and services.

Juran defined quality as “fitness for use,” meaning that the users of products or services should be able to rely on that product or service 100 percent of the time without any worry of defects. If this was true, the product could be classified as fit for use.

Quality of design could be described as what distinguishes a Yugo from a Mercedes-Benz and involves the design concept and specifications. The quality of a product or service is only as good as its design and intention. Thus, it is important to include quality issues in the design process, as well as to have in mind during the design phase the difficulties one might have in replicating the product or service with the intended quality level.

Quality of conformance is reflected in the ability to replicate each aspect of a product or service with the same quality level as that intended in the design. This responsibility is held by individuals to develop the processes for replication, the workforce and their training, supervision, and adherence to test programs.

Availability refers to freedom from disruptive problems throughout the process and is measured by the frequency or probability of defects—for example, if a process does not have a steady flow of electricity and this causes defective parts, or when an employee must complete two jobs at once and is therefore forced to make concessions on the quality of both products or services.

Safety is described by Juran as calculating the risk of injury due to product hazards. For example, even if the product or service meets or exceeds all quality standards and expectations, but there is a possibility that if it is not used properly it could injure someone, the product will not be considered high-quality.

Field use refers to the ability of the product to reach the end user with the desired level of quality. This involves packaging, transportation, storage and field service competence, and promptness.

Juran also developed a comprehensive approach to quality that spanned a product or service’s entire life cycle, from design to

customer relations and all the steps in between. Juran preached that an organization should dissect all processes and procedures from a quality perspective and analyze for a “fitness for use.” Once this is completed the organization can begin to make changes based on the “fitness for use” model.

The Quality Revolution Comes to the United States

The push for increased quality began in American manufacturing companies in the 1980s, following in the footsteps of Japanese manufacturers. Japanese companies found themselves with a distinct competitive advantage over American companies with their ability to produce much higher quality products with fewer defects.

The Ford Motor Company was the first to invite Deming to help the company transform itself into a quality-oriented organization. As a result, Ford was able to achieve higher quality standards than any other American automotive manufacturer and substantial sales growth in the late 1980s even when the rest of the U.S. automotive market was declining. Ford attributes the ability of its Taurus to overtake the Honda Accord in annual sales to the high quality standards set by the company.

The U.S. Congress, seeing the need for American companies to strive for increased quality, established the Malcolm Baldrige National Quality Award, modeled after Japan’s Deming Prize. This spawned a substantial increase in the resources American businesses allocated for quality improvement, and within 10 years an American organization, Florida Power and Light, was able to capture Japan’s Deming Prize for quality.

Since the early 1980s and on into the twenty-first century, quality issues have surfaced in every industry and almost every organization in the United States. The quality movement started in manufacturing and then moved to service industries. Initially service organizations did not feel quality systems would transfer very easily from manufacturing, but today service companies are reaping substantial rewards from implementing quality programs.

Throughout the history of the quality movement there have been several approaches to quality and even the development of several organizations dedicated solely to setting standards for quality.

Standardized Systems

ISO 9000 is a series of quality management systems (QMS) standards created by the International Organization for Standardization, a federation of 132 national standards bodies. The ISO 9000 QMS standards are not specific to products or services, but apply to the processes that create them. The standards are generic in nature so that they can be used by manufacturing and service industries anywhere in the world.

An organization that would like to have ISO certification needs to meet all the criteria stated in the ISO standards and pass a detailed audit performed by an ISO auditor. In some industries ISO certification has become necessary; for example, some large manufacturers require all suppliers to be ISO certified. While ISO certification is highly respected, if it is not a trend in your specific industry, the additional cost of certification is a deterrent to most managers. It is very possible to reach the desired quality level within an organization with a well-planned quality system and without going through all the additional steps for ISO certification.

QS-9000, released in 1994, is the ISO 9000 derivative for suppliers to the automotive Big Three: DaimlerChrysler, Ford, and General Motors. This quality management system standard contains all of ISO 9001:1994, along with automotive sector-specific, Big Three, and other original equipment manufacturer (OEM) customer-specific requirements.

Total Quality Management (TQM)

TQM is a management approach in which quality is emphasized in every aspect of the business and organization. Its goals are aimed at long-term development of quality products and services. TQM breaks down every process or activity and emphasizes that each contributes or detracts from the quality and productivity of the organization as a whole.

Management's role in TQM is to develop a quality strategy that is flexible enough to be adapted to every department, aligned with the organizational business objectives, and based on customer and stakeholder needs. Once the strategy is defined, it must be the motivating

force to be deployed and communicated for it to be effective at all levels of the organization.

Some degree of employee empowerment is also encompassed in the TQM strategy and usually involves both departmental and cross-functional teams to develop strategies to solve quality problems and make suggestions for improvement.

Continuous Quality Improvement (CQI)

Continuous quality improvement came into existence in manufacturing as a different approach to quality and quality systems. It does not focus as much on creating a corporate quality culture, but more on the process of quality improvement by the deployment of teams or groups who are rewarded when goals and quality levels are reached. CQI allows individuals involved in the day-to-day operations to change and improve processes and work flows as they see fit.

CQI implementation attempts to develop a quality system that is never satisfied; it strives for constant innovation to improve work processes and systems by reducing time-consuming, low value-added activities. The time and resource savings can now be devoted to planning and coordination.

CQI has been adapted in several different industries. For example, in health care and other service sectors, it has taken on the acronym FOCUS-PDCA work:

- Find a process to improve.
- Organize to improve a process.
- Clarify what is known.
- Understand variation.
- Select a process improvement.

Then move through the process improvement plan:

- Plan**—create a time line, including all resources, activities, dates, and personnel training.
- Do**—implement the plan and collect data.

Check—analyze the results of the plan.

Act—act on what was learned and determine the next steps.

The FOCUS-PDCA acronym is an easy system for management to communicate to teams, and it helps them stay organized and on track with the end result in mind. The system has proven to be very successful for the CQI team approach.

Six Sigma

Six sigma was developed at Motorola in the 1980s as a method to measure and improve high-volume production processes. Its overall goal was to measure and eliminate waste by attempting to achieve near perfect results. The term *six sigma* refers to a statistical measure with no more than 3.4 defects per million. Numerous companies, including General Electric, Ford, and DaimlerChrysler, have credited six sigma with saving them billions of dollars.

Six sigma is a statistically oriented approach to process improvement that uses a variety of tools, including statistical process control (SPC), total quality management (TQM), and design of experiments (DOE). It can be coordinated with other major initiatives and systems, such as new product development, materials requirement planning (MRP), and just-in-time (JIT) inventory control.

Six sigma initially was thought of as a system that could be used only in manufacturing operations, but more recently it has proven to be successful in nonmanufacturing processes as well, such as accounts payable, billing, marketing, and information systems.

At first glance six sigma might seem too structured to be effective in analyzing processes that are not standard and repetitive as in manufacturing situations, but the theory of six sigma is flexible enough to suit any process. Nevertheless, many of the lessons learned on production lines are very relevant to other processes as well.

The following is a brief description of the steps involved in the six sigma process:

1. Break down business process flow into individual steps.
2. Define what defects there are.

3. Measure the number of defects.
4. Probe for the root cause.
5. Implement changes to improve.
6. Remeasure.
7. Take a long-term view of goals.

ELEMENTS OF A QUALITY SYSTEM

There are several elements to a quality system, and each organization is going to have a unique system. The most important elements of a quality system include participative management, quality system design, customers, purchasing, education and training, statistics, auditing, and technology.

Participative Management

The entire quality process, once started, will be an ongoing dynamic part of the organization, just like any other department such as marketing or accounting. It will also need the continuous focus of management. The implementation and management of a successful quality system involves many different aspects that must be addressed on a continuous basis.

Vision and Values. The starting point for the management and leadership process is the formation of a well-defined vision and value statement. This statement will be used to establish the importance of the quality system and build motivation for the changes that need to take place, whether the organization plans to exceed customer expectations, commit to a defined level of customer satisfaction, or commit to zero defects. The exact form of the vision and values is not as important as the fact that it is articulated and known by everyone involved. This vision and value statement is going to be a driving force to help mold the culture that is needed throughout the organization in the drive for quality. It is not the words of the value statement that produce quality products and services; it is the people and processes that determine if there is going to be a change in quality. The vision and

value will be very important statements to set agendas for all other processes used to manage the quality system.

Developing the Plan. The plan for the quality system is going to be different for every organization, but there are similar characteristics:

- ✓ There should be clear and measurable goals.
- ✓ There are financial resources available for quality.
- ✓ The quality plan is consistent with the organization's vision and values.

The plan for the quality system might also include pilot projects that would entail setting up small quality projects within the organization. This will allow management to understand how well the quality system is accepted, learn from mistakes, and have greater confidence in launching an organization-wide quality system. The plan should provide some flexibility for employee empowerment, because, as has been demonstrated, the most successful quality systems allow employees at all levels to provide input.

Communication. Change, especially a movement toward higher quality, is challenging to communicate effectively, yet the communication process is essential for the company's leaders to move the organization forward. Communication is the vital link between management, employees, consumers, and stakeholders. These communication lines also bring about a sense of camaraderie between all individuals involved and help sustain the drive for the successful completion of long-term quality goals.

Communication systems also must allow for employees to give feedback and provide possible solutions to issues the company must face. Management needs to allow for this in both formal and informal ways, such as employee feedback slips and feedback round-table meetings.

The responsibility for fostering a culture that values communication lies with senior management. They alone have to ensure that goals and objectives are communicated to all. They are also responsible for setting up the system for feedback from the employees.

Rewards and Acknowledgment. Rewards, compensation, and acknowledgment for achievements in quality are very effective ways to motivate employees. They tell employees at the end of the day exactly what management is trying to accomplish. Rewards, compensation, and acknowledgment may also be seen as a form of communication—they are tangible methods that senior management uses to let employees know that quality is important. This could come in the form of individual rewards or team rewards. Rewards, compensation, and acknowledgment take many forms, and it is up to management to ensure that this type of program is in line with the goals and objectives of the quality system and the goals and objectives of the organization. Organizations have found that the best and most cost-effective reward, compensation, and acknowledgment programs are geared to meeting specific criteria. These programs motivate managers who in turn motivate their employees to strive toward predefined goals.

Quality System Design

A quality system is composed of the standards and procedures that are developed to ensure that the level of quality desired is repeated in every unit of a product or service. This portion of the quality system is very concrete and can be measured and managed. Before you start, your organization should establish a core team to carry the performance system design process forward.

The eight steps of the design process are:

1. *Understand and map all business structures and processes.* This forces employees involved in designing a performance measurement system to think through and understand the entire organization, its competitive position, the environment in which it operates, and its business processes. This will also allow for complete understanding of customer touch points and how the different operations in the organization affect the customer's perception of quality. See Figure 14.1 for an example of a process map.
2. *Develop business performance priorities.* The performance measurement system should support the stakeholders' requirements

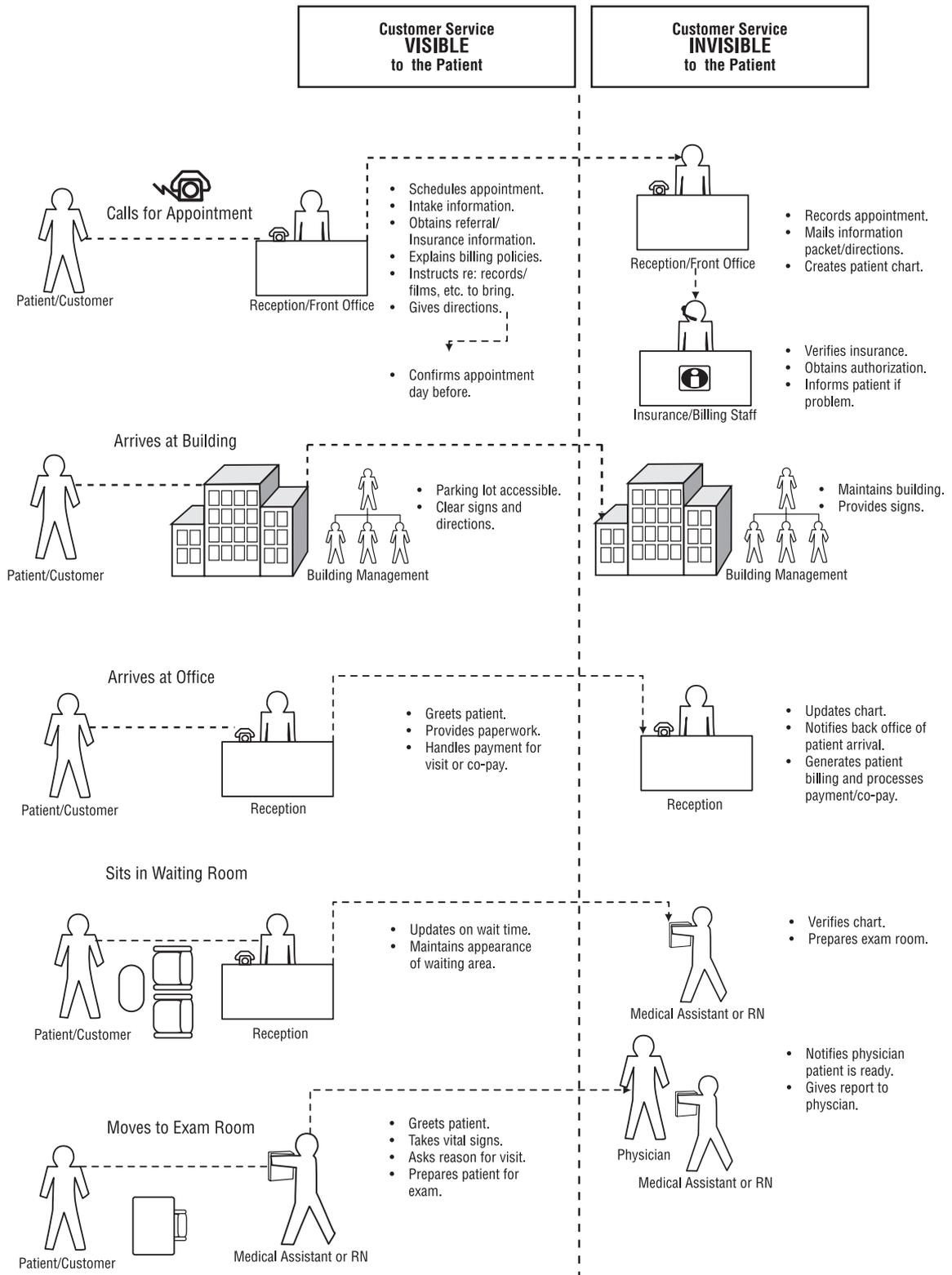


FIGURE 14.1 Service Map Example

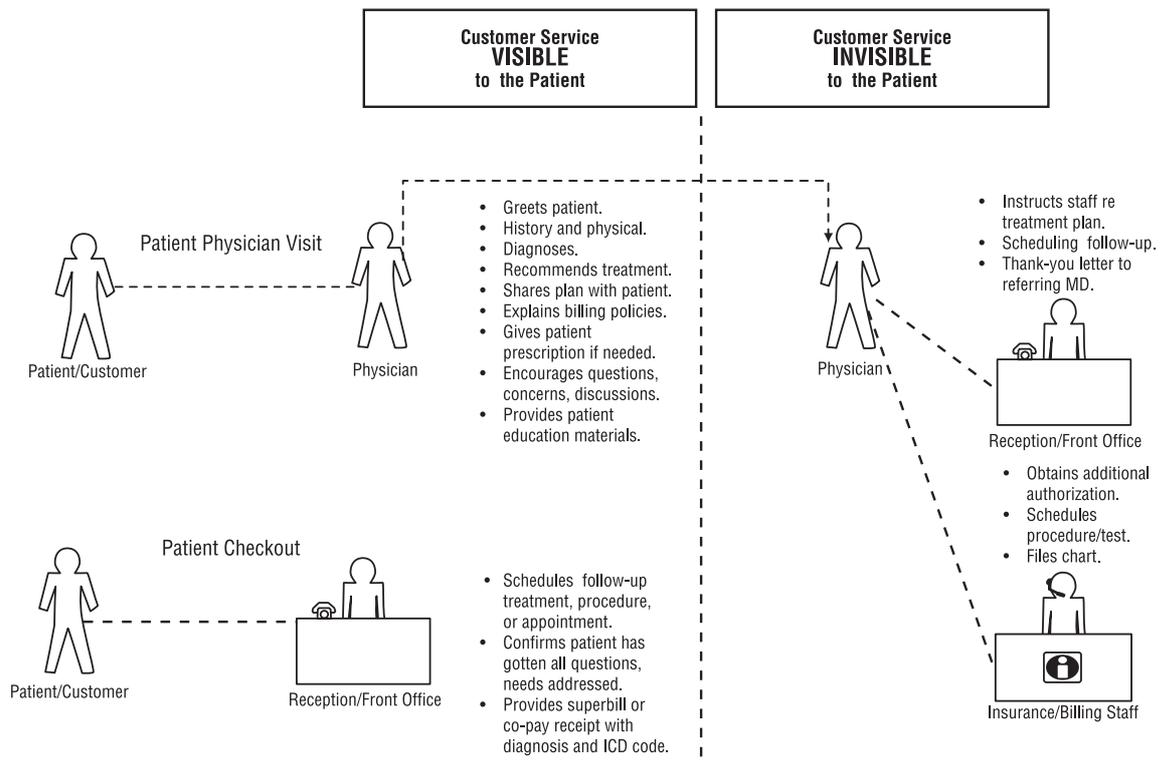


FIGURE 14.1 (Continued)

from the organization's strategy through to its business processes. This order of priorities must be in place well before the process enters the actual design phase.

3. *Understand the current performance measurement system.* Every organization has some kind of measurement system in place. For this reason, there are basically two ways to approach the design and implementation of a new performance measurement system. Either you can scrap the old system and introduce a new one as a replacement, or you can redevelop the existing system. Both approaches can work, but the former approach is more likely to lead to trouble. People will cling to the old measurement system and either use both systems simultaneously or use the old one and simply go through the motions of the new one. You can eliminate this outcome by taking the second approach.
4. *Develop performance indicators.* The most important element of a performance measurement system is the set of performance indicators you will use to measure your organization's perfor-

mance and business processes. This is the point in the design process where the top-down approach meets the bottom-up design approach and where the broad masses of the organization become involved. The purpose of this step is to develop the performance measurement system with an appropriate number of relevant and accurate performance indicators.

5. *Decide how to collect the required data.* Developing perfect performance indicators that will tell you everything you ever wanted to know about what goes on in your organization is one thing, but being able to collect the data required to calculate these performance indicators is a completely different matter. This issue must initially be addressed during the development of the performance indicators so that you avoid selecting those that can never actually be measured. There will be trade-offs of cost and time versus the benefits of collecting data, but a likely middle ground between perfect data/high cost and no data/no cost will be found.
6. *Design reporting and performance data representation formats.* In this step, you decide how the performance data will be presented to the users; how the users should apply the performance data for management, monitoring, and improvement; and who will have access to performance data. After you finish, you should have a performance measurement system that has a solid place in your organization's overall measurement-based management system.
7. *Test and adjust the performance measurement system.* Your first attempt at the performance measurement system will probably not be perfect—there are bound to be performance indicators that do not work as intended, conflicting indicators, undesirable behavior, and problems with data availability. This is to be expected. In this step you should extensively test the system and adjust the elements that do not work as planned.
8. *Implement the performance measurement system.* Now it's time to put your system to use. This is when the system is officially in place and everyone can start using it. This step involves issues such as managing user access, training, and demonstrating the system.

This is not an absolute process that needs to be followed to the letter in order for it to work. In some cases, one or more steps may be unnecessary; in others, additional steps may be needed. It's up to you to make the necessary adjustments to the process to maximize the probability of the system's success.

Designing Part Two of the Quality System

This portion of the quality system is conceptual. It is more about management's role in increasing motivation and the determination to make the first part run smoothly. It is rooted in the communication between management and employees, which was discussed earlier. In most cases, the employees who are performing the activities and process know how to improve the quality. This part of the system should allow employees to make recommendations and motivate them to want to improve quality.

Customers

The inclusion of customers in a quality program can take many different avenues, including the cost of losing a customer, the customer's perception of quality, and the satisfaction level of the customers. The customer portion of a quality program is going to be unique for every industry and organization, but it must capture how quality plays into the customer's value system and how quality drives the purchase decision.

In service industries, in particular, quality is measured in customer retention rates and the cost of losing a customer. If typical accounting measures could capture the exact cost of losing a customer it would be easy for managers to allocate the exact amount of resources needed to retain customers. According to the *Harvard Business Review*, companies can increase profits by almost 100 percent by retaining 5 percent more of their customers. Customers over time will generate more profits the longer they stay with the same company.

Perceived quality by customers leads to referrals; in service industries, referrals can equate to more than 60 percent of new business. If a company can increase the number of referrals through

increased quality, it is going to have a substantial effect on the bottom line of the business.

Purchasing

Purchasing is an area in an organization where substantial gains in quality can be realized through the implementation of just a few policies and procedures designed around quality. Today's suppliers need to be partners in the quality effort. A company's products or services are only as good as the combination of all the inputs.

The first step in molding the purchasing system to collaborate with the entire quality system is to take all the standards developed for all incoming materials that can be qualified as an input to routine process or activity. If the quality system's performance standards and procedures are completed as described in the design phase these standards should already be established.

The second step is educating the purchasing personnel on how the standards are important to the process flows of the organization. If standards are not upheld, the quality of the product or service will be jeopardized. The employees should also be educated on how to measure and communicate the required standards. This may involve materials or statistical process control education, and it could even be as simple as cross-training the purchasing personnel so that they know exactly how the inputs fit into the organization. Once the purchasing area knows how the products are used and what problems can arise, they will have a better chance of procuring inputs that meet all the specifications.

Once steps one and two are complete it will be the purchasing department's responsibility to communicate the requirements to suppliers and hold them accountable for the quality. This sometimes may not be a simple task and could involve finding new suppliers or working with current suppliers to develop higher quality standards.

Education and Training

The education of employees for the purpose of reaching higher quality standards has many different facets. For example, the quality

education of management is going to be different than the quality education of the general workforce, because they play different roles in the process.

Because most quality problems start at the top, so too should education. The education of management on quality issues should start with a general discussion of quality systems and the roles management plays in quality programs. With respect to general knowledge, management must understand the history of the quality movement, who the major players were, and how quality programs have affected the business world. More specifically, managers must know how quality programs have affected their specific industry in the past, and they should have an idea of what role quality programs play in the future of their industry. Management must also keep abreast of new developments in quality. The discussion of the roles that management must play in a quality system is the most important aspect of their education. Management must understand how employees view their actions or inactions, how their individual actions and jobs impact quality, and the overall importance of dedication to quality by management. Managers must understand that without strong leadership and reinforcing dedication to quality, a quality program will not be meaningful.

The education of employees for a quality program will include a discussion of how these programs will affect their jobs on a daily basis. It should also include a brief overview of quality as well as the tools employees will use in order to ensure outputs and how their roles add to the overall quality goals of the organization.

Data Development and Statistics

Statistical analysis is a very important aspect of quality systems. It could be considered a cornerstone of the quality improvement process and is very closely tied to auditing a quality system, which is discussed later in the chapter. Statistical process control (SPC) was what Duran taught as a decision maker in quality systems. Statistical analysis is the measurement portion of quality systems and allows it to be managed. A very common saying in management, which relates well to quality, is “you cannot manage what you cannot measure,” and statistical analysis will give you the measurements necessary to make management decisions.

Statistics was a key tool that Deming used to distinguish between systemic and special causes, and the key to quality management in general was statistical process control. SPC was developed by Walter Shewart while working at Bell Labs in the 1930s, and Deming took Shewart's concept and applied it to quality management. Deming believed that SPC was necessary because variation is a fact of life in any process. Deming believed that it was very unlikely that two products/services when produced by the same procedure and operator would be identical.

Control Charts and Their Role in Quality Systems. Control charts are the most widely used tool in quality systems. Control charts communicate a lot of information effectively. Figure 14.2 shows a process in which all the outcomes are within the specified limits. The upper control limit (UCL) is .18 and the lower control limit (LCL) is .02, and all the points fall between these two limits. This means the process is in control and operating correctly. If some of the points were to fall outside of the UCL or LCL, it would signal that the process is not in control and action needs to be taken to correct the problem.

We discussed earlier the two different types of errors, (1) systematic and (2) special causes. Systematic errors will show up on a control chart as one or two points outside of the control limits with the rest of

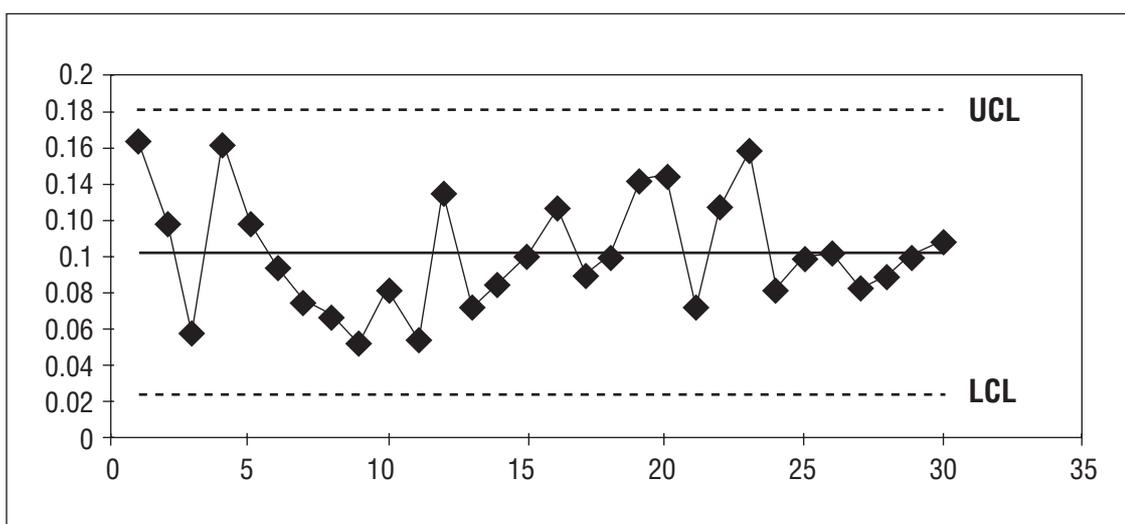


FIGURE 14.2 Control Chart

the points within the limits. Special causes will show up on a control chart with numerous points outside of the control limits.

The exact use of statistical measures is going to be different for each organization. Some statistical analysis will be very easy to set up and use. For example, the length or weight of a particular part can be measured and analysis can show if the parts are within the required specifications. In service industries the statistical analysis will be more abstract, but is just as valuable. For example, one could survey customers regularly and ask them on a scale of 1 to 10, “How would you rate the service?”

Here are some common traits of statistical measures used in quality systems:

- ✓ Are driven by the customer.
- ✓ Reflect vision and values.
- ✓ Benchmarked to the competition.
- ✓ Are achievable.

Auditing

Auditing a quality management system is just as important as any other aspect of the system. The audit process allows everyone involved to see if the quality management system is working correctly and if the goals and objectives are being reached. Auditing also plays major roles in motivating employees and allows for rewards and acknowledgment measures to be assessed as well as possible compensation.

Auditing of quality management systems can take many forms, and each organization will have a unique auditing process that fits its system. Service industries will have a very different auditing system than a manufacturing organization, but the end result of the systems is going to be the same. Here are some examples of auditing systems used in service organizations.

Mystery Shoppers. Shoppers are sent to businesses to interact with employees and assess the overall service quality and report back to management. This is usually done on a regular basis, and reports are produced for the employees.

Customer Surveys. Customer surveys are now well used as a means to find out how your business is viewed by consumers. These surveys can range from mail-in forms to short forms the consumers complete at the time of purchase or even having a salesperson or clerk asking the customer to rate the product or service at the close of the purchase. Getting direct input from your customers is invaluable and should be done in some form in every organization.

New Customer Measures. Measurement over time of the number of new customers can be a very effective tool to assess quality levels. Customers who are very happy with your service are going to tell others—60 percent of new customers in service organizations come from referrals. New customers can be an important litmus test of quality.

Quality in Services. Quality in service industries has more recently come into the mainstream, and the benefits reaped by service organizations initiating solid quality management programs have been substantial. The basis for quality management systems in service organizations is to proactively measure and manage the quality level of the services; some of the metrics applied as the basis of service quality are:

- ✓ The “iceberg principle,” in other words, the average service company never hears from more than 90 percent of customers who are not happy with the level of service they received. For every legitimate complaint received there will be more than 20 customers who feel they have had problems, and at least 25 percent of those problems could be considered serious enough to warrant investigation.
- ✓ Of the customers that make a complaint, more than half will do business again if the complaint is addressed and resolved. If the complaint is resolved quickly, and the customer feels the organization cares about its customers, the number will jump up to almost 100 percent.
- ✓ If a complaint is not resolved, the average customer will tell more than eight other individuals about the negative

experience. If the complaint is resolved, the customer will tell at least five others about the positive experience.

- ✓ On average it costs six times more to gain a new customer than to keep an existing one.

As you can see, quality in service industries can have substantial influence on the bottom line. A well-designed and managed quality system can be the key to providing the quality of service desired.

SUMMARY

The quality movement and quality systems have had many different names or terms of reference in the past few decades, and might look like a short-lived business management trend at first glance. With ever-increasing competition and consumer expectations, professionals and business managers cannot ignore quality issues and expect to maintain or improve their competitive position. Quality systems, time and again, have been responsible for substantial increases in the bottom line of businesses in every industry and have given organizations the boost they need to meet overall goals and objectives. Organizations that do not accept that quality improvement is going to be ingrained into every part of their business are not going to be around to see what the future brings.

RESOURCES FOR QUALITY

Agency for Healthcare Research and Quality

www.ahrq.gov

A U.S. government agency established to improve the quality of health care.

American Customer Satisfaction Index

www.theacsi.org

An organization dedicated to tracking customer satisfaction and providing benchmarks and insights into customer satisfaction.

American Society for Quality

www.asq.org

A nonprofit organization dedicated to the development of quality. The organization offers a wide range of resources for quality professionals.

Baldrige National Quality Program

www.quality.nist.gov

Center for Quality of Management

www.cqm.org/index.html

International Organization for Standardization

www.iso.org/iso/en/ISOOnline.frontpage

Quality Leaders Network

www.qualityleaders.net/qnet/default.htm

APPENDIX

Deming's 14 Points

1. Create constancy of purpose toward improvement of product and service, with the aim to become competitive and to stay in business and to provide jobs.
2. Adopt the new philosophy. We are in a new economic age. Western management must awaken to the challenge, must learn their responsibilities, and take on leadership for change.
3. Cease dependence on inspection to achieve quality. Eliminate the need for inspection on a mass basis by building quality into the product in the first place.
4. End the practice of awarding business on the basis of price tag. Instead, minimize total cost. Move toward a single supplier for any one item, on a long-term relationship of loyalty and trust.

5. Improve constantly and forever the system of production and service, to improve quality and productivity, and thus constantly decrease costs.
6. Institute training on the job.
7. Institute leadership. The aim of supervision should be to help people and machines and gadgets do a better job. Supervision of management is in need of overhaul as well as supervision of production workers.
8. Drive out fear, so that everyone may work effectively for the company.
9. Break down barriers between departments. People in research, design, sales, and production must work as a team, to foresee problems of production and in use that may be encountered with the product or service.
10. Eliminate slogans, exhortations, and targets for the workforce when asking for zero defects and new levels of productivity. Such exhortations only create adversarial relationships, as the bulk of the causes of low quality and low productivity belong to the system and thus lie beyond the power of the workforce.
11. (a.) Eliminate work standards (quotas) on the factory floor. Substitute leadership. (b.) Eliminate management by objective. Eliminate management by numbers, numerical goals. Substitute leadership.
12. (a.) Remove barriers that rob the hourly worker of his right to pride of workmanship. The responsibility of supervisors must be changed from sheer numbers to quality. (b.) Remove barriers that rob people in management and in engineering of their right to pride of workmanship. This means, inter alia, abolishment of the annual merit rating and of management by objective.
13. Institute a vigorous program of education and self-improvement.
14. Put everybody in the company to work to accomplish the transformation. The transformation is everybody's job.

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