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CHAPTER 1

Introduction to Quality

Teaching Notes

In the first class session, we typically provide a few introductory remarks about the importance of quality. A good way to start is to make students read the opener to Part 1 and engage in a discussion of Harrington's comments. We often show a video to further engage students. Many quality-focused videos are available on YouTube. One of our favorite videos features Pal's Sudden Service, which is about a small quick service restaurant chain, and was the first quick service (fast food) restaurant chain to receive the Baldrige Award. A more recent one about quick service restaurant operations is K&N Management, presented as a case in a later chapter of the text. Students can easily grasp the significance of quality in these familiar settings.

The first chapter provides an overview of the importance of quality in a rapidly changing business environment. Actually, that has become a cliché. Perhaps we should use the phrase: "a chaotic business environment." Students at both the undergraduate and graduate level are likely to be taking this course as an elective, so you may have a tendency to assume that they are self-motivated by simply being there. This is not necessarily the case. One of the key goals in Chapter 1 is to distinguish between the traditional notions of quality control and total quality management (TQM) and the modern concept of performance excellence. Whatever the vocabulary, you should try to instill in your students the vital importance of quality and performance excellence in today's business environment.

This chapter also introduces the concept of quality in production and service systems and develops the idea that quality is central to effective operation of these systems. Students should be encouraged to develop an understanding of the fact that quality is not an add-on to organizational processes, but that it is a way of doing business.

Key objectives for Chapter 1 should include:

- To emphasize that of the three important concepts of performance excellence – productivity, cost, and quality – the most significant factor in determining the long-run success or failure of any organization is quality.
- To focus on the multi-faceted definitions of quality. Definitions include transcendent (judgmental) quality, product- and value-based quality, fitness for use (user-based), conformance to specifications (manufacturing-based), and customer perspectives.
- To understand that the user-based perspective requires a definition of customers and related terms. Thus, customers also include **consumers**, who ultimately use a product;

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external customers, who may be intermediaries between the producer and the consumer; and **internal customers**, who are the recipients of goods and services from suppliers within the producing firm.

- To define **specifications,** which are key to the manufacturing perspective, as targets and tolerances determined by designers of products and services.
- To review the evolution of quality from the 12th Century B.C. Zou Dynasty in China, through the Craftsmanship era in the 1700's, through the Japanese post-World War II challenge brought on by attention to quality and international competitiveness, to the "Quality revolution" in the U.S. and elsewhere in the 1980's through the early 21st Century. The revolution came about as a result of consumer pressures, technological change, outmoded managerial thinking, and competitive pressures that changed the way that U.S. and managers around the world viewed the role of quality. The final evolutionary step (so far) is to take the broad view that quality can only reach its full potential if management embraces the concept of performance excellence.
- To introduce the concept of **quality assurance** -- providing consumers with goods and services of appropriate quality, as a point of reference. **Statistical quality control (SQC)** is the application of statistical methods for controlling quality. SQC was vital to military production during World War II, and grew rapidly in application in the following years. These definitions are often how the average person thinks of quality, but it requires pointing out its limitations, as technical, rather than managerial, approaches.
- To provide a framework for understanding that the quality movement has influenced not only product and service improvements, but the way in which organizations are managed, leading to the concepts of **Big Q** – managing for quality in all organizational processes as opposed to simply in manufacturing, referred to as **Little Q**. In addition, **total quality management (TQM)**, or simply **total quality (TQ)**, developed as a total, company-wide effort--through full involvement of the entire workforce, and requiring a focus on continuous improvement – that companies use to achieve customer satisfaction. TQ evolved from earlier concepts of total quality control and companywide quality control as practiced in Japan. Additionally, these concepts are supported by the organizational infrastructure that includes: customer relationship management, leadership and strategic planning, human resources management, process management, and data and information management, as well as a set of management practices and tools.
- To show how aligning and integrating quality principles into all fundamental business activities underlies the concept of **performance excellence,** characterized by delivery of ever-improving value to customers and stakeholders, contributing to organizational sustainability, improvement of overall organizational effectiveness and capabilities, and organizational and personal learning.
- To explore the failures in quality initiatives, usually resulting from managerial mistakes, and how the **Six Sigma** approach, supported by traditional **lean** tools from the Toyota production system, is revitalizing the focus on quality in the 21st century.
- To study the role that quality plays in each component of a manufacturing firm's production and business support systems and to show how they are linked together as a system of processes to support organizational objectives.

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- To develop the view of a production and service systems that focuses on lateral relationships, as opposed to the traditional hierarchical view of organizations.
- To differentiate between production and service organizations, as well as their similarities, and to highlight the differences in service organizations that must be addressed when designing and implementing quality assurance systems.
- To show that quality in manufacturing and quality in services must be approached differently in terms of employees' responsibilities and type and use of technology.
- To investigate the future of quality and reinforce the concept that managers must better prepare and train employees in the philosophy and tools of quality management, and that business leaders must also take responsibility and be held accountable for quality outcomes.
- To provide quality definitions and terminology to be used throughout the text, including term such as: specifications, customers and consumers, total quality, processes, continuous improvement, learning cycles, infrastructure, practices, quality tools.
- To introduce the concept of **competitive advantage,** which denotes a firm's ability to achieve market superiority over its competitors. Quality is a key source of competitive advantage, and studies have shown that quality is positively related to increased market share and profitability.
- To point out that, today, organizations are asking employees to take more responsibility for acting as the point of contact between the organization and the customer, to be team players, and to provide better customer service. Unless quality is internalized at the personal level, it will never become rooted in the culture of an organization.

ANSWERS TO QUALITY IN PRACTICE FEATURES

The Evolution of Quality at Xerox: From Leadership Through Quality to Lean Six Sigma

Although Xerox has had its ups and downs during business cycles, that should not prevent you from using their remarkable turn-around in quality in the 1990's as a lesson in management commitment and focus, which is still having an impact. Instructors may want to point out that Xerox is a prime example of companies that, time after time, have let other business issues blind them to the need for a continued emphasis on quality. Despite thorough training of managers and workers at every level, Xerox failed to maintain the organizational focus that had pulled them from the brink of disaster. Instructors might ask students to research recent quality activities at Xerox and how they have impacted the company.

1. Contrast Leadership for Quality and Lean Six Sigma as quality initiatives for Xerox. How did their motivations differ? What differences or similarities are evident in the principles behind these initiatives and the way in which they were implemented?

In the 1980's, after stumbling badly, Xerox made a remarkable turn-around in quality by developing principles that were very similar to the core principles in this chapter. They incorporated the core principles of: 1) a focus on customer satisfaction; 2) striving for continuous

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improvement; and 3) encouraging the full involvement of the workforce by their three objectives of *Leadership Through Quality* These could be summarized as:

- Quality improvement is everyone's job.
- Meeting the needs of internal and external customers is essential.
- Management and work processes that focus on continuous improvement and customer requirements become a way of life.

The Lean Six Sigma endeavor differs from earlier initiatives in that while it still incorporates the "old" *Leadership Through Quality* approach, it places a new emphasis on:

1. Customer-focused employees
2. Participation and teamwork to attain speed and agility
3. Alignment of individual goals and plans with corporate objectives and results
4. Work processes that are customer-focused and with results built on quality measurement
5. Communication and knowledge sharing for improvement

One key difference appears to be that the new approaches were not just handed down by management, but required a new commitment and involvement of management. In addition, there seems to be a new awareness that quality results require alignment with organizational objectives attained at every level, quality processes based on measurement are the key to customer satisfaction, and knowledge must be obtained from inside and outside the organization and shared through communication in order to achieve continuous improvement.

2. What lessons might this experience—particularly in responding to the new crisis—have for other organizations?

The lessons that are evident in this experience are that excellence in quality requires excellence in management, that you "can't take your eye off the ball" if you aspire to high levels of quality, and that new competitive challenges require new approaches.

In Xerox's first lesson, a repeat of what happened in the early 1980's with different players, there were a number of management problems that occurred at Xerox in the late 1990's and early 2000's that distracted them from what was happening with customers, employees, and the competitive environment. As a result (the second lesson), not much attention was paid to maintaining, much less improving, quality approaches that had been so successful several years earlier. Results were spotty, and efforts were pointed toward making the bottom line look good. The third lesson that became painfully clear was that simply training employees, without management commitment and involvement no longer worked.

A *Business Week* article on March 5, 2001 detailed the many woes of Xerox, especially as it related to top management power struggles and failures to adapt to a rapidly changing technological environment. If one accepts the premise that changing the corporate culture is a necessity for TQ to take root in organizations, then it appears to an outsider that their culture was never really changed, despite their quality successes in the past. Their succession of CEO's, from

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Kearns to Allaire to the recently fired Thoman, made necessary changes to fix problems that were evident at the time, but none of these senior leaders were successful in changing the culture of the copier bureaucracy, "the Burox", as they were called, inside the company. Also, as stated earlier, it is much easier to build and sustain TQ when management has a clear vision, a focus on customers and continuous improvement, strong measurement systems, a cross-functional orientation, and high employee morale. Recently, that has not been the case at Xerox. Both Allaire, who never made a "clean break" after retiring as CEO, and Thoman, who was an outsider brought in from IBM, were accused of having "their reach exceed their grasp" when it came to grand strategies that could not be successfully carried out at an operating level. Can one place blame on its quality management approaches? Probably not, since the TQ approach was highly successful in helping to turn the company around in the 1980's when it was properly implemented. But due to recent strategic and management failures, it was not sustained in the rapid sweep of technological change that Xerox was caught up in.

After some three years as Chairman and CEO, Ann Mulcahy, successfully made numerous radical changes. Recently, her successor Ursula Burns, who is the first black woman CEO of a Fortune 500 company, has set the company on a new path as a business process services company, and away from being a hardware manufacturer and servicing firm. The new quality initiatives, coupled with strategic cost-cutting and new product development, contributed substantially to a new turnaround.

3. Discuss the meaning of "Quality is a race without a finish line." What is its significance to Xerox, or to any organization?

By saying that *Quality is a race without a finish line,* a slogan that Xerox management has recently revived, there is a focus on two things: a) quality must not be just a program that will fade out in a year or two; and b) to embrace the idea of continuous improvement, people must assume that there will always be better ways found to do things. For Xerox, this includes communication, becoming a learning organization, and continuing to use benchmarking, a concept in which the company was a pioneer. Procter and Gamble developed a continuous methods change approach many years earlier in which it was pointed out that: "Perfection [in a process] should be no barrier to improvement." In other words, employees should be encouraged to tinker with a process that is running well in order to make it work even better! The significance to Xerox or any organization is that if you continue to do things the same way, you will soon be behind the competition, if they are making continuous improvements and you are not.

Quality in Practice: Quality Practices in Modern China

1. Do you see any parallels between China's early quality efforts and post–World War II Japan? What differences are evident?

There are obvious parallels between today's China and post-World War II Japan. The Chinese have used their abundant human resources to produce low-cost goods sold around the world.

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They have borrowed technology from the West, because it was cheaper and faster than developing their own independently. The differences are less evident, but have a very large impact. With a Communist government and centralized state control of industries, infrastructure, and processes, bureaucratic and political inefficiencies are common, innovation is slower, and correcting errors and quality problems is not easy.

2. What opportunities can China learn from the progress made in quality in Japan and the West over the past half-century?

China has a significant opportunity to leverage the learning and take advantage of progress made in quality in Japan and the West over the past half-century. For example, the author had been invited to lecture and assist local government officials and industry executives about the Baldrige Award. Because the West has developed a large base of quality knowledge, there is much that they can adopt. Western companies, as well as Japanese ones, are eager to develop partnerships and access to the huge potential market of China's tremendous population base. Thus, they are not reluctant to share at least some of their quality expertise with their Chinese counterparts. In addition, the information and communication explosion during the last decade has made it much easier to obtain information about quality philosophy, tools, and best practices, which can be put to use by managers and quality professionals in China.

ANSWERS TO REVIEW QUESTIONS

1. What factors have contributed to the increased awareness of quality in modern business?

There have been several factors contributing to increased awareness of quality including gaps between U.S. and international competitors' quality levels, product recalls, and massive quality failures. The realization of the superior quality of Japanese, German, and other products from non-U.S. firms in the 1970's, '80's and up to the present (Then, in initial quality levels; today, in long-term product reliability) was a wake-up call about the lack of U.S. quality. In the last 20 years periodic quality issues have arisen, such as the extensive product recalls by the Consumer Product Safety Commission in the early 1980's and the Challenger space shuttle disasters in 1986 and the Columbia in 2003, the first of which most students will not recall. Product recalls such as the ones for brake problems on Toyota vehicles and faulty air bags on cars made by numerous car manufacturers have kept the public's minds on quality throughout the 1990's and into the 21st Century. Improvements in technology, reassessment of inadequate managerial philosophies, and the economic impact of international competitiveness have also been important factors.

2. What practices do Motorola and Mid-America Transplant in the Quality Profiles use to help them achieve high quality?

At Motorola, two key beliefs guide the culture of the firm: respect for people and uncompromising integrity. Motorola was a pioneer in continual reduction of defects and cycle times in all the company's processes, from design, order entry, manufacturing, and marketing, to administrative functions. Customers report high levels of satisfaction, and the division

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demonstrates strong financial, product quality, cycle time, and productivity performance. These results stem from exceptional practices in managing human assets, sharing data and information with employees, customers, and suppliers, and aligning all its business processes with key organizational objectives.

Mid-America Transplant has a mission-driven workforce, and staff members have an exceptional level of understanding of how their individual positions align with the Mid-America Transplant mission of "saving lives through excellence in organ and tissue donation." The organization has a Strategic Thinking Process that involves continuous strategic development, implementation, discussions, environmental scans, industry reviews, and input from key stakeholders. This enables Mid-America Transplant to be agile in identifying, evaluating, and prioritizing change initiatives that respond to strategic challenges and opportunities. Staff members and key Mid-America Transplant partners have real-time access to data, advanced reporting services, and customized analytics. This provides for organizational agility and the ability to act on strategic opportunities.

3. Summarize the six quality perspectives described in this chapter.

The six perspectives are: the transcendent, product, user, value, manufacturing, and customer perspectives. The customer is the driving force for the production of goods and services, and customers generally view quality from either the *transcendent* or the *product perspective*. The transcendent, or judgmental, definition of quality holds that quality is "both absolute and universally recognizable, a mark of uncompromising standards and high achievement." As such, it cannot be defined precisely—you just know it when you see it. It is often loosely related to the features and characteristics of products as featured by marketing efforts to promote product excellence in the minds of consumers.

The *product* perspective implies that higher amounts of product attributes are equivalent to higher quality, so designers often try to incorporate more features into products, whether the customers want them or not.

The *user perspective* of quality is meaningful to people who work in marketing. This leads to a user-based definition of quality – fitness for intended use, or how well the product performs its intended function. The manufacturer must translate customer requirements into detailed product and process specifications. Making this translation is the role of research and development, product design, and engineering. Product specifications might address such attributes as size, form, finish, taste, dimensions, tolerances, materials, operational characteristics, and safety features. Process specifications indicate the types of equipment, tools, and facilities to be used in production.

Product designers must balance performance and cost to meet financial and marketing objectives; thus, the *value perspective* of quality is most useful at this stage. The value perspective looks for the relationship of product benefits to price. From this perspective, a quality product is one that provides similar benefits as competing products a lower price, or one that offers greater benefits at a comparable price.

Organizations want consistency in their goods and services. For production workers, quality is defined by the *manufacturing perspective*. Having standards for goods and services and meeting these standards leads to the definition of quality as: *conformance to specifications*.

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Specifications are meaningless, however, if they do not reflect attributes that are deemed important to the consumer.

Throughout the value chain, each function is an internal customer of others, and the firm itself may be an external customer or supplier to other firms. Thus, the *customer perspective* provides the basis for coordinating the entire value chain.

4. Distinguish among consumers, external customers, and internal customers. Illustrate how these concepts apply to a Chipotle's restaurant, a Walmart, or a similar franchise or chain store.

Consumers are the final purchasers of a product or service. In the case of fast-food restaurants, such as Chipotle, they are the people who buy and consume the restaurant's individually-made tacos, burritos, etc. *External customers* are companies within a "chain of customers," that are provided with goods and services from suppliers. Chipotle would be an external customer of companies that supply food products such as meats, vegetables and other ingredients. *Internal customers* are people, functions, or departments within the company who receive products or services from suppliers within the company. In Wal-Mart stores, the store employees who unload the Wal-Mart trucks on the receiving dock are internal customers to the employees who drive the trucks and make the deliveries.

5. Explain why a single quality definition is not sufficient.

This can be explained in the context of Figure 1.1 and the discussion in the section "Integrating Quality Perspectives in the Value Chain." Customers, and marketing, design, manufacturing functions view quality differently and apply the concepts to meet their own needs.

6. Briefly summarize the history of quality before and since the industrial revolution. What caused the most significant changes?

Evidence of quality dates back to ancient Egypt, as indicated in the precision and uniformity of methods used in the construction of the pyramids. The craftsperson of the Middle Ages took special care to ensure quality in his/her product, a necessary step since he/she dealt directly with the customer. In the late 18th Century, Eli Whitney helped trigger the Industrial Revolution with his development of interchangeable machine parts. The Industrial Revolution itself was a key turning point, since it made quality assurance a critical component of the production process. However, quality was determined only after the products were finished, rather than during the manufacturing process, so as volume increased and costs decreased, craftsmanship decreased.

Quality control techniques were further developed in the early 20th Century, when methods of inspection to improve and maintain quality were gradually separated from production techniques. The significant difference between early and late 20th Century quality approaches was the development of the concept of "total quality" as applied to every area of an organization, not just the production and/or operations functions. At the beginning of the 21st Century, more emphasis has been placed on tying quality to financial results and customer satisfaction by

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alignment of quality objectives with organizational goals, leading to the concept of performance excellence.

7. Define the following terms:

a. **quality assurance** - any planned and systematic activity directed toward providing consumers with products (goods and services) of appropriate quality, along with the confidence that products meet consumers' requirements.

b. **total quality** – a concept which includes the three fundamental principles of: a focus on customers; participation and teamwork; and continuous improvement and learning. It requires that organizations strive to understand the needs and wants of both intermediate customers and final consumers, seek input of ideas and solutions to problems from employees at every level, and continuously look for, test, implement, and evaluate new ways to perform organizational processes, better.

c. **performance excellence** - an integrated approach to organizational performance management that results in: 1. Delivery of ever-improving value to customers and stakeholders, contributing to organizational sustainability, 2. Improvement of overall organizational effectiveness and capabilities, and 3. Organizational and personal learning.

d. **competitive advantage –** a concept that denotes a firm's ability to achieve market superiority. A strong competitive advantage provides customer value, leads to financial success and business sustainability, and is difficult for competitors to copy. High quality is itself an important source of competitive advantage.

8. Explain how each major function of a manufacturing system contributes to total quality.

Quality concerns of each major function within a manufacturing system vary. Thus, each major function contributes to total quality in various ways, as follows:

- *Marketing and Sales* - Effective market research and solicitation of customer feedback are necessary for developing quality products.
- *Product Design and Process Engineering* – Designers and technicians must make sure that products are not over- or under-engineered. Over-engineering results in ineffective use of a firm's resources and products. Under-engineered products with poor process designs result in lower quality as well.
- *Purchasing and Receiving* - The purchasing department must ensure that purchased parts meet the quality requirements specified by product design and engineering. Receiving must ensure that the purchased items that are delivered are of the quality that was contracted for by purchasing and that defective parts are not accepted.
- *Production Planning and Scheduling* - The correct material, tools, and equipment must be available at the proper time and in the proper places to maintain a smooth flow of production.

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- *Manufacturing and Assembly* - Quality must be built into a product; it cannot be inspected into it. Proper control of labor, materials, and equipment is necessary to achieve high quality.
- *Tool Engineering* - Tools used in manufacturing and inspection must be designed and maintained for continual production of a quality product. Tool performance should be consistently monitored so that worn or defective tools can be identified and replaced.
- *Industrial Engineering and Process Design* - Team members from these areas must work with product design engineers to develop realistic specifications of quality. In addition, they must select appropriate technology, equipment, and work methods that will produce quality products.
- *Finished Goods Inspection and Tests* - If quality is built into the product properly and rigorously, inspection should be unnecessary. However, in a less than perfect system, some inspection based on random sampling, or 100 percent inspection of critical components, is still necessary to ensure that no defective items reach the customer.
- *Packaging, Shipping, and Warehousing* - Logistical activities take place in these locations which are designed to protect quality after goods are produced.
- *Installation and Service* – These personnel must ensure that the installation process is performed as specified and that users understand the product and have adequate instructions for proper operation and maintenance.

9. Explain the role of the quality function in a typical company.

The quality function should support and provide guidance for quality activities throughout the organization. This often includes:

• *Quality control (QC)*. Techniques and activities that focus on controlling or regulating processes and materials to fulfill quality requirements and prevent defective products or services from being passed on.
• *Metrology*. Ensuring that the measurements used in controlling quality are meaningful and accurate, and ensuring that measurement equipment is calibrated and traceable to the National Institute of Standards and Technology (NIST).
• *Training*. Providing training that supports employee skills training and education in quality-related topics.
• *Auditing*. Managing or overseeing the activities involved with auditing products, processes, and quality management systems to ensure that the organization's strategies, goals, objectives, policies, and procedures relative to quality are followed.
• *Reliability engineering*. Working with design and production functions to determine product reliability with an aim of lowering total cost of ownership of the product and satisfying customers.
• *Problem solving*. Working where needed to apply expertise, such as the tools of quality control and statistical analysis.
• *Supplier quality management*. Managing or overseeing the activities that ensure that

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high-quality suppliers are selected and that incoming purchased parts and materials are acceptable in grade, timeliness, and other characteristics.
• *Product/service design*. Working with sales, design, and other functions to ensure quality in products under development.

10. Why is service quality especially important in today' s business environment?

Service is defined as: "any primary or complementary activity that does not directly produce a physical product -- that is, the non-goods part of the transaction between buyer (customer) and seller (provider)." Service firms are organizations in industries and sectors including: hotels and lodging places, and establishments providing personal, business, repair, and amusement services; health, legal, engineering and other professional services; membership organizations. Real estate sales and services, financial services, retailers, transportation, and public utility organizations are also generally considered to be service firms. Basically, they include all nonmanufacturing organizations except such industries as agriculture, mining, and construction.

Quality in services is important in today's business environment because poor service often leads to lost customers (up to 35% per year) and therefore lost income. Retaining customers can mean a profit increase because it is more cost effective to retain them than to acquire new customers. Companies with long-time customers can financially outperform competitors with higher customer turnover, even when their unit costs are higher and their market share is smaller. Quality has moved beyond technical issues such as reliability, inspection, and quality control in manufacturing, because of changes in the economy and in society. Some of these concerns center on the increasing focus of businesses on service and knowledge creation and management.

11. Discuss the differences between manufacturing and service organizations. What are the implications of these differences for quality management?

Differences between manufacturing and service organizations are significant, yet both types have activities that fall into manufacturing and service categories. The contrasts between service and manufacturing quality include:

- Customer needs and performance standards are difficult to quantify in services.
- The production of services often requires a high degree of customization.
- The output of many services is intangible, unlike manufactured goods.
- Services are produced and consumed simultaneously.
- Customers must often be involved in, and present, during the performance of the service process.
- Services are more labor intensive, where manufacturing is more capital intensive.
- Many service organizations and their processes involve large numbers of transactions.

12. Explain the roles of people and information technology in providing quality service. How does The Ritz-Carlton Hotel Company, LLC use employees and information technology for quality service?

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Employees need information technology as a tool for providing quality service in today's fast-moving business environment. Information technology is essential in modern service organizations because of the high volumes of information they must process and because customers demand service at ever-increasing speeds. Intelligent use of information technology improves quality and productivity, and also leads to competitive advantage, especially when technology is used to better serve the customer. At the Ritz-Carlton Hotel Company, L.L.C., a corporate-wide database is used to record customer preferences, previous difficulties, personal interests, and preferred credit cards of each of more than 800,000 customers. Thus, front-desk employees can determine that a customer needs a non-smoking room, prefers non-scented soap, and often travels with a small child who will need a crib.

13. How can business support activities help to sustain quality in an organization? Give examples of some key business support activities and their role in quality.

Business support activities must aid in quality production in their own separate ways, but still remain aligned with the organizations' purpose, objectives, goals, and plans. Support activities help to provide for specialized handling of non-core processes. Thus, team members in the core activities can focus on quality issues in their own areas. Key business support activities play a role in sustaining quality as follows:

- Financial studies can help expose the costs of poor quality and propose ways of reducing it. Accounting data are useful for identifying areas for quality improvement and tracking the progress of quality improvement. Financial and accounting personnel can also apply quality improvement techniques to improve their own operations.
- Human resource managers must ensure that employees have the proper skills, training, and motivation to do quality work, and that they are recognized and rewarded for such. They must also be given the authority and responsibility to make critical quality decisions when necessary.
- Quality assurance specialists in quality assurance departments assist managers by performing tasks such as statistical tests or data analyses, special statistical studies and analyses, and may be assigned to work with any of the manufacturing or business support functions. It must be remembered that a firm's quality assurance department cannot guarantee quality. Its proper role is to provide guidance and support for the firm's total effort toward this goal.
- Legal services personnel in the legal department attempt to ensure that the firm complies with laws and regulations regarding such things as product labeling, packaging, safety, and transportation; design and word warranties properly; ensure that the firm satisfies its contractual requirements; and develop proper procedures and documentation for use in the event of liability claims against it. The rapid increase in liability suits has made legal services an important aspect of quality assurance.

14. How does quality support the achievement of competitive advantage?

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A firm's competitive advantage lies in its ability to achieve market superiority. It is a) driven by customer wants and needs; b) makes a significant contribution to the success of the organization; c) matches the organization's unique resources with opportunities in the environment; d) is durable, lasting, and difficult for competitors to copy; e) provides a basis for further improvement; and f) provides direction and motivation to the entire organization. Quality supports a firm's competitive advantage by providing for more efficient use of resources and production methods within the company, thus producing products or services that are superior to those of competitors.

15. What did Philip Crosby mean by "Quality is free"?

The late Philip Crosby made the point that "quality is free" because he wanted to emphasize the savings and benefits that have since been more fully (see answer to question 15, below) documented, in terms of design and conformance quality. Money saved by avoiding scrap, rework, and a poor reputation for quality shows up in the bottom line as higher profits. Although it costs money to start and maintain a quality process, it is a proven fact that quality pays in the long run.

16. Explain the role of both design and conformance quality in improving a firm's profitability.

A product's value in the marketplace, and hence, its profitability, is influenced by the quality of its design. Conformance quality is achieved through adherence to specifications of the product, as designed. Improved conformance to quality standards in production also saves rework, scrap, and warranty expenses, thus decreasing manufacturing and service costs. Overall quality can be enhanced through improvements in performance, features, and reliability within the product that will help differentiate it from its competitors. The result is improvement in the firm's quality reputation and the perceived value of the product, and will allow the company to command higher prices and achieve a greater market share. This leads to increased revenues, which offset the costs of improving the design.

17. What evidence exists to counter the claim that "Quality does not pay"?

The evidence to counter the claim that "quality does not pay" is mounting. For example, the Department of Commerce studies of Malcolm Baldrige Award winners through 2002 showed that an investment in common stock of the winners would have produced a 3.8 to 1 advantage over a similar investment in the S&P 500. However, in 2003, for the first time since the Baldrige Index was established, the S&P outperformed the index, primarily because of the depressed stocks of a number of high-tech companies that have won the Baldrige. The Hendricks and Singhal study (see text reference) of 600 publicly traded firms that have won quality awards showed significant positive differences in performance measures versus their control groups. Quality-focused companies have frequently attained outstanding operational and financial results. These have been extensively illustrated in this and succeeding chapters in the quality profiles of the many firms that have received the Baldrige Award. In addition, various studies

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done by associations and government agencies such as the GAO study, Commerce Department studies, and the documentation required from Baldrige Award applicants and winners all provide evidence that quality does indeed pay.

18. Why is it important to personalize quality principles?

Personal quality is an often-neglected area, which, if emphasized, can have a significant impact on individuals and organizations. Simply by recording defects in specific categories, the number of defects can often be reduced. In addition, this approach can make individual employees in an organization aware of how the quality process works, give them an appreciation of the power of quality tools, and help them realize how their own quality actions may impact the firm.

ANSWERS TO DISCUSSION QUESTIONS

1. Discuss how either good or poor quality affects you personally as a consumer. For instance, describe experiences in which your expectations were met, exceeded, or not met when you purchased goods or services. Did your experience change your regard for the organization and/or its product? How?

Students should have numerous personal examples of how good and poor quality has affected them. Often, they are harder pressed to come up with an example of good quality than one of poor quality. For example, one of the authors experienced outstanding quality when he went to a computer store and selected a printer. After completing the paperwork and payment part of the transaction, the store employee went to the back, retrieved a sealed box containing the printer model that was purchased, cut the tape on the box, attached the printer to a computer with the correct cord which he picked from many on the rack. He ran the printer through a print test, repacked the printer, re-taped the box, carried the printer to the author's car, and placed it carefully in the trunk!

2. Discuss the importance of quality to the national interest of any country in the world. Given China's emergence as a global economic power, of what importance do you believe that quality will play in their future?

Quality has been a topic of national interest in the U.S. as well as to countries around the globe since the discovery by many consumers in the early 1970's that many goods and services produced in certain quality-focused countries, or by specific companies, had higher quality standards in production and better track records with consumers. In the past, American negligence of quality resulted in consumers preferring foreign-made products. This preference increased business for foreign competitors, allowing them to establish an American business presence, increase their market share, and thus decrease sales of American-made products, domestically, as well as internationally. This has continued into the present, with China's dominant role in producing consumer goods for the world market. In the long run, this can cause the economic health of the nation to suffer. However, more and more U.S. businesses have

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recognized that they are vulnerable to both foreign and domestic competition if they don't have competitive quality levels. So they are taking steps to counter the competitive threat by paying attention to quality issues. There are even businesses which are pulling back from foreign outsourcing and producing components and products in the U.S. (called *on-shoring*) in order to regain control over quality and eliminate issues due to extended supply chains.

3. We noted that high quality is not necessarily related to price. Discuss this, drawing from your own knowledge and experience, and provide examples where this may and may not be true.

As emphasized throughout this chapter, quality has a number of definitions and aspects. Thus it is difficult to say whether quality is closely or distantly related to price in a specific case. Most people, whether rich or poor, exhibit some sense of being value-conscious in defining quality. They look for bargains where they can get more, and/or spend less, than they had expected for a similar good or service. Thus they want to obtain the "biggest bang for their buck," whether buying a luxury SUV or an economy sub-compact car. Either or both of those can be bargains if they are designed and built with quality, have the features that the customers are looking for, are priced competitively, and are fit for intended use. Students can and should be able to cite situations in which they have found a quality product at a bargain price, and situations in which they did NOT receive a bargain, despite a very low or very high cost of the product. However, researchers have found that one cannot determine quality from price alone. One can find very good wines, for example, at a low price point. Other examples, are store-branded merchandise compared with national brands.

4. A reader wrote to Business Week (July 9 & 16, 2007, p. 16) and noted: " Americans have switched from Detroit Big Three vehicles to Honda and Toyota vehicles not for visual design features but for durability, reliability, good fuel consumption, and low full cost of operation. Detroit needs to offer five-passenger, 35-mile-per-gallon vehicles with 100,000-mile bumper-to-bumper warranties over 10 years of ownership to cause satisfied Honda and Toyota buyers to switch." What definitions of quality are implied in these comments?

The definitions of quality implied in these comments emphasize a product-based and "fitness for use" perspective, based on value. The writer may also be implying that the after-market service quality of the traditional Detroit auto companies is not competitive with such firms as Toyota or Honda. While the reader is probably on the mark about the needs of a large segment of the automobile buyers market, his/her comments do not necessarily cover the "fitness for use" categories of buyers who are looking for cars with primary characteristics of safety or those whose purchase decisions are driven by design/luxury and aesthetic values.

5. Choose a product or service to illustrate how several definitions of quality can apply simultaneously.

Students should be able to find many good examples. For example, if a student chooses an Apple watch, he or she may point to its transcendent quality. The student might say, "I just like the

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'look and feel' of the Apple watch. When you look at it, it's obvious that it's a quality product." In speaking of product-and value-based quality, the student might point out that the watch has a lot of features for the price. To judge fitness for use, the student may say, "I want to send and receive text messages, check my Facebook page, monitor my vital signs during my workout, and converse with my boyfriend. I need the functions and apps that the Apple watch has, and has made easy to use." Finally, when judging conformance to specifications, the student may look the product up online, and find out if claims for battery life hold true for current users.

6. Think of a product or a service that you are considering purchasing. Develop a list of fitness- for-use criteria that are meaningful to you.

As in question 5, students might choose any one of dozens of products or services to illustrate. Fitness for intended use should answer questions such as: Does the product perform as advertised? Is the product user-friendly, and affordable for both consumers and the manufacturer? Is the product durable? How does the product stack up against other competitive products, which may have different features?

For example, they might choose to discuss purchase of a used car to drive to school and work. The list of fitness for use criteria might include initial price, cost to operate and maintain, ease of driving, power, aesthetics. If a comparison is made between a used Ford Focus and a Honda Civic, the Focus might be inexpensive to purchase, moderately economical to own, easy to drive, low-powered, not very comfortable, and not very attractive in design. The Civic (assuming comparable age and mileage) might be more expensive to purchase, more economical to operate than the Ford, easy to drive, moderately powered, comfortable, and have a more attractive design than the Focus.

In applying these definitions to a service (e.g. a cellular phone service provider), students should ask questions such as: Is the service affordable? Cost-efficient? Are employees sensitive to customer needs? Does it have any hidden requirements or misleading claims? How does this service compare with, a competitor's phone service in price, features, and reliability? How often does the service incur dropped calls? What about geographic area coverage?

7. A top Ford executive stated "You can't have great value unless you have great quality." Comment on this statement. Do you agree? Why or why not?

This statement essentially validates the value perspective we discussed in the chapter. Students should carefully consider their personal perspective of value. Clearly, many do not want to spend a lot of money on goods and services (except, perhaps, cell phones!). So even if a product is inexpensive, the quality must be there in order for it to have value. This is a good question to get students to think about their personal perspectives on value.

8. Discuss how the factor of the frequency with which you anticipate using a product might impact the quality and price that you are willing to pay and how it relates to the value-based definition. Provide some examples to justify your reasoning.

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Most consumers are somewhat value-conscious. However, frequently-used products provide an additional layer of complexity for quality. Often, such products are in the nature of commodities, such as milk, gasoline, or restaurants. Thus, we may look for consistent quality, ease of access, and good value. If these are present, small variations in price are unlikely to affect our purchasing decision. However, for products that you might use infrequently, for instance, golf clubs that might only be used a few times a year, you might not be willing to pay a large price or expect high quality. Avid golfers might think differently.

9. *PCWorld Magazine* changed its method of rating new products to base scores only on product performance, design, and features, dropping price as a criterion, although it will be clearly stated. Their reasoning was "When we used price as a criterion, high-flying products often got dinged for having higher-than average prices, while budget items got a boost based on value. Now superior products—those that are well designed, easiest to use, feature rich, and power packed—get our highest rating." How does this approach relate to the definitions of quality? Does it help or hinder consumers?

This approach by *PCWorld Magazine* particularly impacts, and seems to down-play, the value-based definition of quality. Price is a quality characteristic which most consumers consider. If price is held constant, while other characteristics are compared, then it is often easier to make a value-based decision. If price comparisons are not made, as implied by *PCWorld*'s new approach, the reader may experience difficulty in arriving at a decision.

It is true, however, that taking a transcendent perspective, as *PCWorld* appears to be doing, has the advantage of assuming that product excellence is not always closely tied to price. Alternatively, by taking the user and the fitness for use perspectives, the number of features, and their contribution to the satisfaction of the users' needs, may be adequate for the person who is exploring their options. If the reader is interested in the transcendent quality of the product and is not particularly price sensitive, then *PCWorld*'s approach makes sense.

10. What definition of quality is implied by the following consumer advertisements? Explain your reasoning.

Several of the examples described can be seen as appealing to more than one definition in order to attract the quality-minded consumer.

a. An ad for Rosetta Stone language software that features dozens of languages, covers a range of five levels (beginning to advanced), provides live online practice sessions with native speakers, furnishes mobile apps for smart phones and computer pads, and boasts a 30-day money-back guarantee, all for under $200. Additionally, they say: "Three reasons to get started today: 1) Rosetta Stone solutions have brought language learning success to millions all over the world. Proven to work. Prove it to yourself. 2) It' s fun, effective, and enjoyable. Don't be one of the 20% of Americans who list 'not learning a language' as one of their life' s biggest regrets. 3) Studies suggest that trying a new skill— like learning a new language— is effective at helping you develop and maintain mental fitness. Rosetta Stone offers a choice of 30 languages."

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The Rosetta Stone ad emphasizes multiple features and "fitness for use." They also have a value-oriented appeal in providing many features at an attractive price.

b. To justify their top-of-the-line oil change service at $49.95, a Goodyear store features Valvoline oil. The ad states: SynPower Full Synthetic Lube, Oil, Filter 100% synthetic oil outperforms all other oil types delivering maximum protection against heat, deposits, and wear. Valvoline SynPower Full Synthetic Lube is crafted with 100% synthetic motor oil, and outperforms all other oil types. It also:

- **Delivers more protection than any other oil type**
- **Helps improve and maintain fuel efficiency**
- **Provides the ultimate protection against heat, deposits & wear**

Valvoline tries to provide a value perspective at a high price-point. They point to the many advantages of a premium oil product. The company must then deliver by ensuring that the product lives up to expectations.

c. Toyota advertises that its subcompact Yaris model has a myriad of brake-related safety features. They point out that: "Yaris comes standard with the Star Safety SystemTM, a suite of six advanced safety features that includes Vehicle Stability Control (VSC), Traction Control (TRAC), Anti-Lock Brake System (ABS), Electronic Brake-force Distribution (EBD), Brake Assist (BA), and Smart Stop Technology (SST)."

In this ad, Toyota emphasizes the product perspective, and implicitly, the value perspective. That is, you CAN get a safe, economical car from Toyota.

d. A Bulova watch add that explains "Most quartz watches are accurate to 15 seconds a month—Bulova Precisionist is accurate to 10 seconds a year. The key is Precisionist's unique three-prong quartz crystal, which produces a vibration frequency of 262.144 kilohertz, eight times greater than the usual two-prong crystal and the highest of any watch available today. And, the innovative design of the Precisionist movement reduces the effects of temperature variation without using a high maintenance thermo-regulating integrated circuit. The result is a watch that is extraordinarily precise, yet so easy to operate."

The Bulova Precisionist ad implies that they deliver the highest level of product-based quality, based on the company's "transcendent" quality reputation. At the same time, there is an appeal to the person who has a product perspective, by citing the technical features and details of how the product achieves its characteristics.

e. Barracuda Networks, Inc., makes commercial antivirus hardware and software "packages," such as The Barracuda Web Filter. It advertises that: "The Barracuda Web Filter lets organizations benefit from online applications and tools without exposure to web-borne malware and viruses, lost user productivity, and misused bandwidth. As a comprehensive solution for web security and management, it unites award-winning

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spyware, malware, and virus protection with a powerful policy and reporting engine. Advanced features ensure that organizations adapt to emerging requirements like social-network regulation, remote filtering, and visibility into SSL-encrypted traffic."

Barracuda emphasizes features, which focuses on the product perspective. It could also be seen as a customer-focused product, which is fit for intended use.

f. An ad for the Microsoft Surface computer tablet explains: " Can't decide between a new tablet or laptop? Step up to Microsoft Surface, the device that goes from tablet to laptop in a snap …great for staying productive and entertained from anywhere. Use Office to create Word documents, PowerPoint presentations, and Excel spreadsheets, or use Outlook to check your email. Stay in touch with family and friends on Skype, and store all your photos and videos with 1TB of OneDrive online storage. Surface is one of the best tablets around for surfing the Internet, playing games, or streaming movies and TV shows from popular sites like Netflix and Hulu."

Microsoft's Surface computer ad is designed to emphasize Microsoft's persistent practice of providing a multiplicity of features. Thus it has a product perspective, but also implies a customer perspective of fitness for intended use.

11. What do you think are the most important lessons that managers can learn from studying the history of quality management?

Each era of quality has important lessons which managers can learn from, if they pay attention. Some of these lessons are suggested in bold-faced type in the following summary of quality history. Evidence of the search for quality dates back to ancient Egypt, as indicated in the **precision** and **uniformity of methods** used in the construction of the pyramids. The craftsperson of the Middle Ages took **special care to ensure quality** in his/her product, a necessary step since he/she **dealt directly with the customer**. In the late 18th Century, Eli Whitney helped trigger the Industrial Revolution with his development of interchangeable machine parts, requiring the understanding of **specifications and tolerances**. The Industrial Revolution itself was a key turning point, since it made **quality assurance** a critical component of the production process. However, quality was determined only after the products were finished, rather than during the manufacturing process, so **as volume increased and costs decreased, craftsmanship decreased**. Quality control techniques were further developed in the early 20th Century, when **methods of inspection to improve and maintain quality** were gradually separated from production techniques. The significant difference between early and late 20th Century quality approaches was the development of the **concept of "total quality"** as applied to **every area of an organization**, not just the production and/or operations functions. In the early 21st Century, the emphasis has been placed on bringing quality improvement to the "bottom line" results by **alignment of quality objectives with organizational goals**. Perhaps the most important lesson is not to ignore quality when other business fads become popular!

12. Consider the following views of quality:

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a. a strategic asset and competitive differentiator
b. a proactive continuous improvement activity
c. a tool to fix problems
d. a risk mitigation activity
e. a compliance activity

How would you order these in terms of increasing organizational maturity? What organizational changes do you think need to occur as an organization moves to the next (more mature) view of quality in this progression?

The following views of quality are ordered in (approximate) order of quality maturity:

e. a compliance activity
d. a risk mitigation activity
c. a tool to fix problems
a. a strategic asset and competitive differentiator
b. a proactive continuous improvement activity

If the quality focus of the organization is merely compliance or risk mitigation (c. and d.) then the maturity level is somewhat low. Management is playing defense. It is a step upward to begin to use the quality effort to find and fix quality issues. Finally, taking a strategic view and moving to continuous improvement indicates increasing quality focus and maturity. In order to be able to move to the next level, managers must emphasize self-assessment, develop quality metrics, train employees in quality techniques, and continuously refine and improve the quality system.

13. Provide some specific examples that illustrate how the three major themes cited in the American Society for Quality's 2015 futures study are reflected in today's business news.

These themes were:

1. *Organizations must knock down silos of information in order to get the right information to the right places. Where speed of decision and speed of action is crucial, very careful decisions will have to be made about what to share and what to hold close*. Students might point to the use of teams and cross-disciplinary activities in organizations.
2. *Organizations must begin to think differently about things they assume to know quite well, such as customers. Even though organizations will get better in understanding customers, it will be difficult to keep pace with rapid changes in the nature of customer demand*. Students might provide examples of the many innovations the continually are developed, even such simplistic ones as "free shipping."
3. *The implications of almost limitless connectivity will change how organizations must think about, and do, almost everything. Everything – from connectivity in smart manufacturing, to medical schools holding classes for thousands of students simultaneously around the world, to city management, where a crisis in one sector can be immediately identified, communicated, and reacted to in seconds – will affect everything else, both for better and for worse*. This might reflect changes in social media, use of the Internet of Things, and so on.

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14. Provide specific examples of how the differences between manufacturing and service organizations are evident in a school or a hospital.

Under certain conditions, a hospital or a school could be said to have both manufacturing and service characteristics. The differences between manufacturing and service organizations are evident in schools and hospitals in various ways. Using the list from the chapter, the contrasts between service and manufacturing quality include:

- Customer needs and performance standards are difficult to quantify in services.
- The production of services often requires a high degree of customization.
- The output of many services is intangible, unlike manufactured goods.
- Services are produced and consumed simultaneously.
- Customers must often be involved and present during the performance of the service process.
- Services are more labor intensive, where manufacturing is more capital intensive.
- Many service organizations handle large numbers of transactions.

For example, in schools, determining what a "good" student is creates difficulties, particularly for learning disabled students, gifted students, and "average" students. These categories often drive the need for customization of curricula. Obviously, the output is intangible, and such services are produced and consumed simultaneously. These and other differences between manufacturing and services show up in hospitals. For example, customers must be involved and present when brain surgery is done to relieve the symptoms of Parkinson's disease. Services in the operating room are labor intensive, when a large surgical team is involved in performing a heart transplant. Large numbers of transactions are involved when a patient has a major infection that requires a long hospital stay, many procedures, and many medicines to be administered on a day-by-day schedule.

15. Select a service activity with which you are familiar. If you were the manager of this activity, what "conformance to specifications" criteria would you use to monitor it?

Student answers will vary here, also, according to their experience. For this question, students will need to determine the targets and tolerances for their individual service activities that permit "conformance-to-specifications" to be measured. Targets will be the specific services that employees should provide, and the specific values that employees will demonstrate. Tolerances will be the standards set up to determine what is necessary when employees miss the mark; in other words, what is acceptable (i.e. an employee being five minutes late 5 times) and what is unforgivable (an employee being two hours late three times)? For example they might choose a package delivery service, such as UPS or FedEx. Then the "conformance to specifications" to monitor would be such things as: percent of output sorting to incorrect locations, in the sorting hub; percentage of packages loaded on the wrong truck at the distribution center; and percentage of packages not delivered on-time, based on route statistics.

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16. Cite some examples from your own experience in which you felt service quality was truly top-notch, and some in which it was not. What do you think might be some of the fundamental differences in the infrastructure and management practices of these organizations?

Student experiences where service quality was truly top-notch, and some in which it was not, will vary. Students may tend to dwell on poor quality service, first. You may have to probe student's memories to have them relate some "good quality" stories. For example, one of the authors stayed in a hotel that was operated by a large eastern university. The desk employees (probably students in hospitality management) were polite and well trained, and the bed in the clean, well-furnished room was comfortable. However, after arriving late at night and settling into bed, the antiquated heating system went through loud cycling changes every 10 or 15 minutes. The switching on and off of the system, accompanied by hisses and bangs, left the customer, who was too tired to change rooms, with a fitful night of sleep. He went to the checkout counter the next morning and complained about it, asking for a reduction in the room rate. To his surprise and delight, the young student clerk said, “We’ll just cancel your bill!” That’s employee empowerment! Infrastructure and management practices of such organizations might involve the degree of customer focus, employee empowerment, training, and quality control and assurance.

17. How are people and information technology used to improve service in your college or university?

People and information technology may be used to improve service in a college or university by providing services over the internet, such as registration, grade delivery, financial aid information, library services, payment methods for copying, printing, and food services, etc. Many universities are installing integrated Enterprise Resource Planning (ERP) systems to integrate support processes for planning, budgeting, enrollment management, etc. Often, in a web-based system, students will be able to retrieve grades for courses right after they are posted, view their transcript to see what courses have been taken or still need to be taken, and post their e-mail to friends and professors. Many professors are putting assignments, grades, PowerPoint slides, lectures, or whole courses on the Web to improve service to students. Other schools are delivering emergency warning messages for weather alerts or suspected terrorist events, simultaneously to cellphones and e-mails of students, faculty, and employees of the organization.

18. What role has the Internet played in improving service quality? What barriers to service quality might it have?

The Internet has played a significant role in improving service quality. For example, many banking transactions, which used to require face-to-face or telephone interaction, such as check deposits, applying for a loan, checking bank balances, etc., now can be done online, without human intervention. However, these very characteristics can sometimes throw up barriers to service quality, such as the difficulty of correcting errors in bank transactions, the inability to apply human judgment when a loan application is rejected, etc.

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19. In this chapter, we noted that much of the work performed in traditional manufacturing organizations now involve service. Provide some examples of this, drawing upon the functions illustrated in Figure 1.2.

One good example is a machine tool company. Although its primary focus is on building machine tools for other manufacturers, there are many service activities involved. For instance, the sales team must acquire customers; product designers will often meet with customers to understand their needs and custom design machine tools. Production schedulers might work with customers to meet their needed deadlines. Installation is often part of the contract, and installers will set up the machine on-site and often provide maintenance and repair.

20. Choose an organization that you have read about or with which you have personal experience and describe their sources of competitive advantage. For each, state whether you believe that quality supports their strategy or does not support it.

One example of a highly competitive organization is United Parcel Service (UPS). UPS has competitive advantages that are linked to efficiency and economies of scale. They use a combination of ground and air transportation, depending on the customer's needs for speed of delivery. They adjust staffing levels to meet processing requirements by using a mix of part-time and full-time employees. They track the delivery of packages using electronic scanners, and they use GPS technology to locate vehicles. In addition, they use sophisticated operations research software to set up optimal delivery routes in order to minimize wasted time and delivery costs. These appear to support their stated strategic goals. Their strategy statement (Source: http://www.investors.ups.com/phoenix.zhtml?c=62900&p=irol-govhighlights, [see *UPS Values, Mission and Strategy*]), in part, is:

> **UPS Enterprise Strategy**
> *Create Value, Transform, and Invest to Grow*
> - Create value for customers using our superior portfolio of logistics capabilities
> - Continually transform to strengthen our leadership position
> - Invest to accelerate growth in key markets and new opportunities

21. How can you internalize and practice quality at a personal level in your daily activities?
Students might start by thinking about how the definitions of quality relate to their lives, what "defects" they might encounter and how to remove them, who their internal customers are and how they can better serve them, how to continually improve what they do on a daily basis. Most importantly, make a commitment to quality and not be satisfied with mediocrity.

SUGGESTIONS FOR PROJECTS. ETC.

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1. Develop a portfolio of advertisements from newspapers and magazines and illustrate how quality is used in promoting these products. How do the ads imply the different definitions of quality?

The results will vary, depending on the ads that the student chooses. Students might use ideas from Discussion Question 10.

2. Choose an organization of interest, conduct appropriate research, and write a case similar to the Xerox Quality in Practice in this chapter, documenting their quality journey and practices.

Such projects not only help students understand the role of quality in organizations, but also help improve their writing skills.

3. Examine the annual reports of one company over a period of years. Summarize how quality is discussed or implied in the company's statements and philosophy. Are any changes in the perspectives of quality evident over time?

There is a great deal of information available on the annual reports of companies available in college library databases, as well as on corporate websites. See the Deere & Company case at the end of this chapter.

4. Conduct some research on quality practices that is focused on a particular country or global region. Summarize your findings in a two- to three-page report.

Doing research on quality practices focused on a particular country or global region can help students to appreciate the global scope of quality. While the emphasis may be different, the fundamentals of quality will undoubtedly be found to be universal.

5. Visit the web site for the American Society for Quality (www.ASQ.org) and write a short report on the services and resources it offers to quality professionals.

This is a good project to help understand the role of the society and encourage students to join at a reasonable student rate.

6. Interview some key managers at a nearby manufacturing company and construct a diagram similar to Figure 1.2 showing the company's key functions and their relationships. Summarize the major quality concerns of each function.

This project should provide students with insights into how the various functional areas are related to one another. Depending on the amount of cross-functional work that is done, students may have difficulty identifying "departments" with some functions. For example, many companies have now done away with departments of industrial engineering and process design. A central group at corporate headquarters may do purchasing.

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7. Interview some managers at a local service organization and summarize the role of people and information technology in providing quality service. How are people and information technology integrated into long-range improvement plans and strategies?

If some of the students in the class do project 1 and others do this project, it can provide a very interesting contrast. Most service businesses, even very small ones, are highly dependent on their information technology and employee know-how in their efforts to provide quality service. Perhaps more rare will be the firms that have long-range improvement plans that integrate employee skills and evolving technology into the organization's strategy.

8. Develop a "personal quality checklist" that you would like to achieve each day and analyze the results over an extended period of time. … After completing the project, answer these questions:

a. What did your analysis reveal?
b. Did you find that you improved simply because you began to measure these "defects"?
c. How did you feel about discussing your progress with others?
d. How might such a process help in a work environment?

This approach, developed by Roberts and Sergesketter, was used for several years by one of the authors (Lindsay) as a class assignment with both undergraduate and graduate students in Quality Management and Production and Operations Management courses. Student response at the end of the term was overwhelmingly positive. Answers are based on experiences in these classes.

a. Student analysis, backed up by use of the checksheet, a scatter diagram, and Pareto charts, tend to show an initial, often dramatic drop in total weekly defects over the first three or four weeks. Later in the study period, regression often occurs because of exam weeks or project assignments coming due. The final several weeks of the study period often show another drop in the scatter diagram of defects, possibly because the final project report comes due and people want to "look good."
b. Sergesketter's results are widely observed in students' charts. Students are encouraged after submitting the mid-term project report to assess their strengths and weaknesses and to drop and add items that may be too easy or too impossible to attain. However they are required to continue to track a minimum of eight goals (four academic and four non-academic).
c. Some students are very wary of revealing their defects to others, or discussing how they are doing except in very general terms. Others are more open to the process, and often get significant help from their peers in reaching or exceeding their goals.
d. The personal quality project can help the students to understand how difficult it is for managers to plot data systematically, take corrective action based on facts, or break "bad habits" of producing defective parts. Thus, personal goals, such as "getting to class on time" can be related to "getting to work on time" or delivering the customer's order on time. "Zero Defects" on the next exam can be as difficult as "Zero Defects" in the factory. "Casting Out

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Fear" may be illustrated if the professor assigns grades for this project based on whether the students write excellent reports that are well-documented and analyzed, not on whether their defect totals went down a certain amount over the term, or whether students were pleased or angry with their own results. This can be related to the workplace idea that managers don't fire employees for producing a defective item if it is beyond their control.

ANSWERS TO CASE QUESTIONS

I. Skilled Care Pharmacy

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

1. Various definitions of quality such as: transcendent quality, product-and value- based quality, fitness for use, and conformance to specifications could be applied to Skilled Care's operations. Transcendent quality is perhaps conveyed to customers by hearing about and observing Skilled Care's "dedication and commitment to continuous quality improvement." The product-, user-, value- and manufacturing-based definitions are reflected in the Skilled Care Quality Policy, which has references to service and product quality, customer satisfaction, and the team approach taken by the firm. As do many businesses, Skilled Care's philosophy closely adheres to the definition of quality as "meeting or exceeding customer expectations." If they can successfully carry out the intentions of their Quality Policy, they will do well.

2. Accepted quality principles include: a focus on customers; participation and teamwork; and continuous improvement and learning. These are supported by the organizational infrastructure that includes: customer relationship management, leadership and strategic planning, human resources management, process management, and data and information management, as well as a set of management practices and tools. Skilled Care has outlined their understanding of the three core principles in their Quality Policy. Other indicators of their existing organizational infrastructure include the pharmacy software system, Rescot, and their partnerships with other firms to provide multi-dose packaging, and wholesale purchasing. Their 24/7/365 operations point to a heavy customer commitment, and their web-enabled customer service and Track-It reporting system indicate customer relationship management and complaint resolution capabilities.

3. The company does face strategic challenges in financial, human resources (obtaining licensed pharmacist personnel and employee retention), and environmental factors relating to medical practice. A total quality approach can help to develop senior leaders and systematic strategic

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planning, articulate strategic objectives, and align and deploy quality strategy and day to day practices with strategic goals in order to better service their customers.

II. Dinner On-the-Go

Using the six quality perspectives and any other concepts discussed in this chapter to advise Chelsey on what she might consider to assure high quality for this venture.

Chelsey should be aware of, and use the six different perspectives: transcendent, product, value, user, manufacturing, and customer as a guide for designing her restaurant. Dinner On-the-Go's customer's perceptions of transcendent quality must be built over a period of time. Chelsey apparently has a viable and innovative concept in developing a line of takeout home-cooked meals. Now she must develop every facet of the business to impress, excite, and delight the customer. She can provide the product features that are most appealing to her customers, such as taste, presentation, quality of ingredients, and food safety. Pricing will need to be set so as to appeal to the customer's sense of value. From a user perspective, attention should be paid to such things as product packaging, so as to make the various foods easy to handle and use, all the way from the restaurant/outlet to the home. From a manufacturing perspective, consistency of materials, serving sizes, and preparation methods are keys to customer satisfaction and delight. Finally, a customer perspective demands getting to know the customers, so that their wants and needs can be anticipated and fulfilled.

To assist in designing the restaurant, itself, its products and its processes, Chelsey should incorporate TQ into the design of her business, including:

1. A focus on customers and stakeholders
2. Employee engagement and teamwork by everyone in the organization
3. A process focus supported by continuous improvement and learning

Points 1 and 2 must be addressed before the restaurant/outlet is opened. She must determine how to obtain information about customer needs and preferences for home-cooked take-out, as well as dine-in, meals. She could do this by benchmarking successful restaurant chains with take-out meals, such as Bob Evans, Marie Callender, and others with similar services. Also, in her geographic area, she might perform market studies to better focus on her specific market segment. In addition, if feasible, she might do a focus group study to discuss potential products and preferences.

Point 2 must be addressed in setting the criteria for excellence and using them during the recruiting, screening and hiring of her workforce. Chelsey must not allow herself to view her workforce from the conventional attitude that they are just "labor." Instead, she must recruit, screen, hire, and train associates who will be expected to be quality-minded, knowledgeable, and creative partners in developing the business.

Point 3 is extremely important, but must grow out of insights developed from points 1 and 2. In other words, Chelsey must develop processes that are customer-centric and take advantage of the knowledge and creativity of her associates. These must also evolve and be

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improved over time, as experience is acquired. Improvement and learning must be continuous and systematic, rather than occasional and erratic.

Chelsey should plan strategically for growth and development of the business. She should ensure that senior leadership understands the meaning of performance excellence and is capable of developing the mission, vision, and values that will sustain the organization. Chelsey will need to set up a performance measurement system, with key metrics with which she and her leadership team can set goals and objectives for the business and gage the health of the business once performance is being measured.

Customers and workforce need to be engaged, as suggested in the discussion of principles 1 and 2. The process must be developed and continuously improved, as pointed out in Principle 3. Information and knowledge must be systematically developed for both strategic and operational purposes. Since Chelsey has indicated that she wants the business to be the "best in class" sources will have to be found for comparisons with local, regional, and national "benchmark" firms and best practices. Finally, leadership must not only set the mission, vision, values, and goals of the organization, but they must "walk the talk" by providing concrete actions and being role models of quality.

With these approaches, it is highly likely that the Dinner On-the-Go restaurant will quickly obtain a local and regional reputation for quality and performance excellence.

III. Who's Responsible for the Quality?

Discussion Questions

1. Who is responsible for the quality from inkjet production printing?
2. How might a company such as Xerox work with inkjet customers to ensure quality?

1. As Howie Fenton said: The answer is: it depends. It depends on whether you're willing to live within the recommendations made by the manufacturer or you want to try to save some money by deviating from those recommendations. These questions and debates typically appear in early stages of a new technology such as inkjet production printing. There are different stages of adoption of new technology. These early stages include the pioneers or early adopters who often struggle with these questions until the technology and equipment goes more mainstream. Sometimes the adoption of a new technology becomes disruptive.
2. According to Fenton: If a person looks at the Xerox Impika website, (http://www.impika.com/index.php?id=consommablesetaccessoires) they will find recommendations about ink. A presentation at the IMI show (http://www.impika.com/fileadmin/mes_documents/pdf/White_paper/Presentation_IMI_Nov 08_Lisbon_.pdf), describes how different inkjet devices print on paper, plastic, and even packaging materials. As a result, one can assume that if you follow the manufacturer recommendations you should be able to avoid the typical problems associated with new substrates. As an added safeguard, Xerox has developed a process for inkjet customers to determine compatibility with various substrates prior to the customer's purchase. If they want to pursue a paper stock not on the "tested media list", Xerox can test their desired paper stock

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to determine if it is acceptable and supported. This takes the guesswork and risk out of the process so that the customer can be confident that they can safely use the expected inkjet product and attain the required paper performance.

IV. Deere & Co.

Assignment

On the basis of this information, prepare a brief report discussing Deere & Company's evolution of quality. Relate your discussion to historical trends, future challenges, the various definitional perspectives of quality, and other issues discussed in this chapter, including quality perspectives. For example, how has their perspective of quality and the practices used to implement it changed over the years? Update the case by reviewing Deere's latest annual report and include any new information in your analysis.

There is no correct solution to this case problem, but a number of useful teaching points can be brought out after students have done their analyses. Specifically:

- In 1999, the themes of continuous improvement, profitable growth, and business innovation continued to be dominant. The continuous improvement area featured six sigma quality goals for performance and customer satisfaction. It was mentioned that during the year some 900 projects involving several thousand employees had been carried out. These six sigma projects had the objectives of streamlining business processes, focusing on customers, and structuring around core processes.
- In 2005, Deere employees were aligned with business objectives and evaluated and compensated accordingly. Most salaried employees worldwide followed detailed, tailored performance plans that spelled out how each individual's efforts contribute to meeting unit and company goals. Also stewardship of the environment was emphasized, pointing to how the company developed product solutions that were less disruptive to the surrounding environment, such as the John Deere 2500 E greens mower that uses hybrid technology, resulting in lower noise, better fuel efficiency, and plenty of power (18-hp); the Tier 3-compliant PowerTech Plus engines using the latest technology to deliver better fuel economy and more power while meeting stringent emissions regulations; and becoming the first equipment manufacturer to use biodiesel as a factory fill at its U.S. manufacturing locations.
- In 2008, Deere emphasized four key approaches: rigorous processes, the Deere Product Quality System, corporate responsibility, and an emphasis on a performance-based work culture. Following rigorous processes everywhere helped Deere address the growing scope and scale of operations and achieve increased levels of consistency, simplicity, efficiency and quality. Many of their approaches were unique to Deere and hard to copy. Concurrently, the company implemented the Deere Product Quality System (DPQS), a set of world-class manufacturing practices designed to meet rising customer expectations for increased product reliability. Product lines responsible for most of the company's sales received advanced quality

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certification through 2008. Deere affirmed that it takes its responsibilities seriously. This included continuing to set employee safety as one of John Deere's top priorities, and endeavoring to treat the environment with increasing care, by making sustainability an integral part of its operations. Their biomass energy system went into operation during the year at their German combine factory. Further in 2008, Deere announced plans to reduce greenhouse gas emissions from its global operations as part of participation in the U.S. Environmental Protection Agency's Climate Leaders program. Finally, John Deere established a performance-based culture that features employee teaming and collaboration, promotes a global and inclusive work environment, and helps the company strengthen its competitive advantage through the attraction and retention of highly talented employees from all backgrounds.

- In 2010, Deere took a more strategic business focus. Their strategy concentrated on two growth areas – agricultural and construction equipment solutions. Other operations – turf, forestry, parts, engines, intelligent solutions, and financial services – were said to have vital roles supporting or complementing the growth operations. Deere's lineup of tightly knit operations were designed to leverage strengths, optimize investments, efficiently target leadership and employee resources, and extend its ability to compete in the global marketplace. The company set goals that would result in a near-doubling of sales, a healthy increase in profitability, and an almost three-fold increase in economic profit, or SVA, by 2018. The strategic plan targets roughly half of the company's sales coming from outside the U.S. and Canada by 2018, versus about one-third in 2010. Financial performance measures were implemented to ensure that results would be sustainable as growth was being accelerated. Business "health" metrics were developed, pertaining to product quality, market share and employee engagement, among other areas.
- In 2012, Deere continued their strategic business focus theme.
- In 2015, Deer placed more focus on quality and innovation in order to better satisfy customers and win market share, and improve its manufacturing quality before products reach customers.
- In 2017, quality and innovation focus continues, along with stronger relationship building with dealers (as external customers of Deere).

These summaries definitely show an increasing commitment to TQ concepts. The early use of TQ concepts was actually started when Deere began to focus on TQ concept in the 1990's. Management has continually emphasized productivity and cost reduction as the key to excellence. In the mature and very competitive heavy equipment industry, the changing focus on human resource practices and stewardship of the environment in 2008, 2010, and 2012 signaled that cost reduction, quality improvement and "value to the customer" may be defined in a different way that will convey an updated image to the average buyer. Also, there seems to be increasing and sustained interest in promoting and supporting citizenship efforts, which is sometimes called corporate social responsibility. In recent years, the quality focus has intensified along with innovation and building external customer relationships. For the latest Deere annual report, go to: http://www.deere.com.

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CHAPTER 1

Introduction to Quality

ANSWERS TO INSTRUCTOR RESERVE MATERIALS

Instructor Reserve materials are older Quality in Practice features and Cases from previous editions that may be used by the instructor to give the students additional experiences. These are available in the Instructor materials in a separate folder.

Quality in Practice: Building Trust Through Quality at Gerber

1. Gerber exemplifies several of the definitions of quality, including: transcendent quality, product-and value-based quality, fitness for use, and conformance to specifications. The company has enjoyed a superior brand image and exceptional customer loyalty for decades, transcendent quality traits of the "I know it when I see it." quality definition. As will be seen below, Gerber's quality is based on value and is also well grounded in solid processes, conformance to specifications (especially in product safety measures), and this ensures that their products are fit for intended use.

2. Gerber improved their customer focus by implementing a real-time customer feedback process via 800-number telephone lines in the 1980's. It later extended that service to 24 hours a day in the 1990's to provide even more customer access than previously. Employee participation and teamwork had to be gradually developed and fine-tuned from the 1970's into the 1980's, as employees and supervisors were trained to take on more responsibility for quality and process improvement. Gerber had always had a process focus, with a concentration on the best processes and ingredients for its products. Once teams were operating well, the company began a sustained effort to increase process control while decreasing line inspections. Front-line operators assisted in establishing procedures for each process and taking responsibility for quality, thus freeing inspectors to perform quality audits, instead of inspections. This HACCP-type system anticipated the new USDA guidelines by several years and enabled Gerber to stay ahead of the competition in developing and using this type of system. This resulted in a process improvement mentality that line employees bought into.

3. The consumer tampering case brought unwelcome media attention, and a full-scale investigation of Gerber's quality processes. Because of the level of documentation, and Gerber's continuous improvement efforts, the FDA gave Gerber a "clean bill of health" after only three weeks. This saved the company from further damaging after effects of the incident and proved the value of vigilant attention to processes and documentation.

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Case - A Total Quality Business Model

1. Rob and Diane have a well-thought-out system for developing a sound infrastructure for their restaurant. In customer relationship management, they seem to have covered most of the bases on current needs and satisfaction. However, they may want to develop ways to tie these results into both their strategic planning process (what type of customers will they appeal to, what are their customer-related objectives that they will build into their marketing plan, etc.?) They may also need to consider a process to determine future needs of customers, perhaps by using a focus group, or groups. Will there be a need to develop products and services in the future to meet the needs of business customers, professional groups, etc.? Should they go into related businesses, such as catering, manufacture of specialty items for retail markets, etc.

   The leadership and strategic planning framework seems to cover the vision, organizational structure, and processes that are needed. However, more emphasis is needed on setting, communicating, and deploying organizational values, performance, and expectations, action planning, allocating resources, projecting and improving performance, and encouraging environmental and community responsibility.

   Human resource management concepts are good, in that they promote thorough training, benchmarking, and teamwork. However, management training could be done more systematically, rather than being "self-directed." In addition, experienced managers should also take part in the training process to give the benefit of their experience. Managers is the same "cohort" of people who joined the firm at the same time, should get together periodically to have updated training and share best practices.

   The process management of food production is a very important area. However, other processes, and process improvement, must also be considered, from customer relationship management, to training, to marketing, to scheduling, inventory management, and financial and cost control.

   Data and information management is essential. However, it must be considered as the result of various processes, not the "process" itself. Employees need to be given relevant information, not be overwhelmed with data. Therefore, posting of all of these measures may not be desirable for all employees. Selected measures that have to do with overall performance, customer satisfaction, and overall financial performance of the firm (if employees are trained to understand such data) may be all that is required.

2. Viewing the organization at three levels may help to determine what is the most important quality focus. At the strategic level, top management needs to deal with competitive strategy, goals, objectives, and resource allocation. At the tactical level, middle managers need to be concerned with strategy deployment, acting as a conduit to and from top and first-line management, development and improvement of systems, recruiting and training managers, and monitoring results. At the operational level, first-line managers and

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employees should be concerned with processes for service delivery, keeping in contact with customer needs, teamwork, and process performance and improvement.

Case - Is Quality Good Marketing or Is Good Marketing Quality?

The value in this case study is to show students that quality concepts can be applied in retail service operations, and thus is not limited only to the production of tangible goods.

1. The actions taken by the company to please the customer address points 7 of Garvin's quality dimensions (described in detail in Chapter 4 – Customer Focus) -- aesthetics and also the area of perceived quality. Store appearance, warehousing policies, delivery standards, and customer relations all reinforce the visual (aesthetic) dimension of quality and add to the "image" (perceived quality) of the store(s). One area that was not addressed was that of support functions, such as accounting and purchasing, whose associates may interact with customers and/or suppliers. Have they been trained to use TQ concepts to improve product quality and excellent service, as well? For example, are accounting and purchasing processes being continually improved? Are suppliers (including company and non-company manufacturers) aware of the quality specifications and goals of the retailer? Are they working together to reduce time-to-market and to design products that will keep the customers coming back, based on quality of design as well as service excellence?

2. The franchiser's statement that: "The best way to assure quality is through product inspection and market research," could be open to some debate. If market research is not closely linked to product design, then customers may not be offered the product that they want or need. If continuous improvement and teamwork is not part of the process for delivering the desired product or service, then product inspection may come too late to be advantageous.

3. To answer the question: "Is quality good marketing, or is good marketing quality?" one must realize that the field of marketing grew up as a result of a "backlash" against "salesmanship" in the 1950's. At that time, the purpose of a "salesperson" was to sell whatever products the factory could produce, whether the customers wanted to buy them or not. Marketing suggested the radical concept of trying to find out what the needs of the customer were and then providing a product to fill those needs. As the PIMS studies have shown, quality is directly related to market share and to profitability. Other studies have shown that people are willing to pay more for products that they perceive as having high quality. Thus, without high quality, good marketing of products and services would appear to be impossible, since salespeople would have little to sell that would meet the needs of their customer. However, without good marketing, where salespeople listen and respond to the needs of customers, even the best-designed products will remain unsold.

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Case: A Total Quality Business Model

Two young entrepreneurs, Rob and Diane, were contemplating an idea of developing a new type of take-out restaurant with limited dining facilities that would provide a wider variety of home-cooked cuisines than found in currently available businesses. In developing their business model, they realized that a TQ-focused management infrastructure would be vital to success. Here are some of the ideas they arrived at.

Customer Engagement

Rob and Diane realized that they must focus on the customers' perceived quality of both the product and service. They believe they must provide unexpected value to their customers and go beyond customer expectations to create lifetime customers. As part of training, employees will focus on "moment of truths"—the many instances that a customer forms an impression of the company, either through its products or interactions with its employees. These moments include a friendly greeting to each customer on arrival, recognizing repeat customers, offering samples of different items, answering questions, serving the products, and a genuine thank-you on leaving. Another way to exceed expectations would be to accommodate any reasonable request. Employees would have the authority to do whatever it takes to satisfy the customer. When a complaint is raised, the employee should act immediately to solve to the problem, listen attentively to the customer, and apologize. No matter what, the customer should always be thanked for bringing the complaint to the staff's attention.

To evaluate the customer's experience, the company would require shift managers to be the first customer on each shift, starting from the parking lot to check its cleanliness. In addition, they would use technology to track service times and complaints, and "mystery shoppers" each month throughout the system. Every quarter, all regional store and shift managers would meet to discuss their experiences and seek improvements.

Leadership and Strategic Planning

The leadership system would consist of regional vice presidents responsible for all of the stores in a geographical area, regional managers in charge of about a dozen stores within a region, store managers responsible for the day-to-day operations, and shift managers to

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manage the employees on each shift. This "cascading" structure would allow communications to be disseminated rapidly throughout the company, both top-down and bottom-up. A manager training and development program would ensure that each level of manager obtained the necessary skills for their job responsibilities. This training would not only address the needs of entry-level managers, but also those who move up the career ladder in the firm into higher leadership positions.

The company's vision would be simple: to be the consumer's choice for all varieties of fresh convenience meals. The strategy would be based on product quality (variety, freshness, value) and outstanding customer service. Rob and Diane realized that every employee needed to understand the company strategy, which would be conveyed during the employee orientation and management training and development programs. Managers would be responsible for ensuring that all hourly employees focus on these two goals through daily meetings, written quality check sheets that must be completed on every shift, and an employee stock-option program that would be tied to meeting these goals as well as profit targets.

Workforce Management

All managers would be trained in several positions in order to gain a solid understanding of the duties and requirements of all employees, to be able to cover certain positions if needed, to train hourly employees, and to gain credibility with them. The training program for a new manager would be designed to be somewhat self-directed. The manager trainee would be given a skill checklist that includes each skill he or she should learn. Experienced trainers would be available to answer any questions and assist the manager trainee with any difficulties. Trainees would be given short evaluative tests and feedback from the trainer. Before their first day of work, all hourly employees would attend an orientation session focused on making them feel welcome in their new work environment. The session would include a history of the company, mission, policies, and training procedures. To keep good people, the compensation program would need to be competitive in the industry. Managers would be required to visit local competitors to identify their compensation structure and compare them.

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Job performance of all hourly employees would be reviewed periodically using performance appraisals by the store manager after the first 30, 90, and 180 days of employment, followed by annual appraisals. The appraisal would cover such topics as customer focus, quality of work, teamwork, and responsibility. It would also require the employee to identify future goals and objectives and plans for improving performance.

Process Management

All food production processes would be carefully documented so that all employees are aware of what specifications must be met, particularly those health and safety requirements that regulated temperature of food and proper storage. Managers would be responsible for taking periodic measurements and observations to ensure that all employees are following procedures. Managers would also be responsible for their relationships with food suppliers. Rob and Diane are thinking of identifying one large supplier for most of their food supplies.

Information and Knowledge Management

All key data and information, such as inventories, financial reports and projections, customer feedback, employee and operational performance, would be collected and displayed in the kitchen area, so all employees can understand the results of their efforts. Information from all stores would be consolidated at corporate headquarters for evaluation and analysis.

Discussion Questions

1. What advice might you give Rob and Diane about the management practices they are proposing within each element of the TQ infrastructure? What additional practices might you suggest?
2. How might viewing the organization at three levels of quality, including the strategic (senior leadership), tactical (middle management), and the operational levels help improve their business plan?

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Case: Is Quality Good Marketing or Is Good Marketing Quality[1]

Quality is important to the employees of a Fortune 500 leisure furniture manufacturer and retailer. Franchise owners are required to operate their stores with a focus on high quality, knowing that their license may be revoked if the corporation judges their quality to be inadequate. Franchise owners recognize that commitment to quality begins with management and filters down to all areas of the business. Managers believe that if they cut corners, their employees are likely to do the same. They emphasize that things should be done correctly the first time and that there is always something that can be improved. They are never totally satisfied with the present level of quality. This commitment to the pursuit of excellence is passed down to every employee. The franchisor's quality motto is "Excellence and quality are not destinations; they are journeys." maker.

Quality efforts are made in all areas of the business in an attempt to achieve "Zero Unsatisfied Customers." The first thing a customer notices at each franchise store is its "curb appeal." The parking lot is kept clean. An attractive sign displays the mission of the company, which explains the company's commitment to satisfying customers through service, selection, and value. When the customer enters the showroom, several displays of furniture are visible immediately. These displays, called vignettes, are small room settings including, for example, a sofa, on or two chairs, a coffee table, and an end table. Lamps and accessories are included in the vignettes, although the store carries very few such items and most are not available for purchase. Vignettes show the different styles (country, traditional, contemporary, and transitional) that are available. The vignettes are intended to provide the customer with an "impression of quality" upon entering the store. Much care is taken in designing the vignettes, right down to the spacing between the pieces of furniture, and they are constantly monitored. The entire showroom is dusted and cleaned at least once a day; carpets and upholstered furniture are shampooed every month. The sales counter is kept neat and uncluttered. As one franchisee stated, "Never give a customer a reason not to buy."

Training and continuing education of a high quality sales staff is a company priority. The salesperson must believe in the store's product and service quality and attempt to instill this in customers' minds. The salesperson must attempt to understand customers' needs and to satisfy them with the company's products. All salespersons seek five key pieces of information about the customer. The first concerns the customer's tastes, involving questions such as:

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[1] We thank our former students William Wenz and E. Allan Hilsinger for conducting the research from which this case is adapted.

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1. Have you been shopping for furniture recently?
2. How long have you been shopping?
3. Where have you been shopping?
4. What piece or pieces have you seen that you like?

The second is who is the purchase-decision maker. (In many cases, this person is not present.) The third area is timing. Does the customer need the merchandise by a certain date or for a particular reason? The fourth piece of information is how much the customer wants to invest (not spend). Finally, the salesperson asks how the customer wishes to pay for the merchandise and offers several payment options. The salesperson sends each customer, whether a purchaser or not, a thank-you note as a follow-up.

The franchisor also emphasizes quality in warehousing. This includes handling of the product from the point of receiving until its shipment from the warehouse. Furniture received at the warehouse is inspected for defects, such as rips and scratches. If a defect cannot be repaired, the unit is promptly shipped back to the manufacturer. The next step is to steam out any bumps or creases that occurred in shipping. When furniture is delivered to a franchisee's showroom, the vice president of merchandising is responsible for placing it in the showroom for proper price-tagging.

For customer delivery the store rents professional-looking uniforms for its delivery personnel. The delivery equipment is well-maintained, clean, and reliable. Trucks are cleaned every day and repainted frequently. The trucks are on a tight maintenance schedule in order to maximize reliability. Customers can request a guaranteed two-hour delivery window. Delivery personnel call the day prior to the scheduled delivery to remind the customer of the time and to confirm that someone will be home. At the customer's residence, delivery personnel must complete tasks specified on a checklist, including placing the furniture exactly where the customer wants it, confirming that items such as recliners are in working order, demonstrating proper operation when appropriate, and other tasks. The delivery person is not permitted to leave until the customer is satisfied with the product and the service. If there are any problems or complaints that cannot be resolved by the delivery person, he or she must contact the manager and arrange a solution.

Customers receive numerous guarantees, including lifetime parts warranties, seven-day exchange privileges, and in-home consultations. Follow-up telephone calls ask customers about their feelings toward all aspects of their experience with the purchase. They are asked about store appearance, if the merchandise was in excellent condition when delivered, if it is sufficient to

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meet their needs, how the delivery personnel performed, and so on. As one franchise owner sums it up, "The best way to assure quality is through product inspection and market research."

Discussion Questions

1 Of what value in achieving quality are the actions this company takes in store appearance, warehousing, delivery, and customer relations? Can you think of other aspects of quality that have not been mentioned here?

2. Do you agree with the franchisee's statement at the end of the case? Why or why not?

3. How would you address the question posed by the case title?

Quality in Practice: Building Trust Through Quality at Gerber[i]

The Gerber baby picture -- which accompanies everything from strained carrots and banana cookies to teething rings and diapers -- has developed into one of the most recognizable brand images in the world. According to Gerber, the company received the highest customer loyalty rating out of 3,500 U.S. corporate and product brands, topping companies such as Nike and Coca-Cola. To parents around the world, the Gerber baby means quality, and the Gerber company has long been a leader in using quality tools to uphold its reputation. While Gerber's quality programs have gone through various stages over the years, their goal has remained the same: to make sure consumers continue to see the Gerber baby, which has gone through periodic updatings of its own, as an emblem of excellence.

Gerber is the leader in the development, manufacturing and marketing of foods and products for children from birth through age 3. The company dominates the U.S. retail baby food market with a 70% share against competitors Heinz and Beechnut, and rings up about $1 billion in annual sales. Gerber employs 6,200 people altogether at its headquarters and main processing plant in Fremont, MI, and its plants in Fort Smith, AR; Costa Rica; Mexico; Venezuela; and Poland. Together these facilities produce 190 food products -- which are labeled in 16 languages and distributed to more then 80 countries. Gerber's Baby Care product line (featuring items such as rattles, bottles and eating utensils) was launched in 1960 and currently features some 300 products. This line is largely manufactured in Reedsburg, WI, and China. In 1994, Sandoz Ltd., a pharmaceutical manufacturer, purchased Gerber. The 1996 merger of Sandoz and Ciba Geigy, also known for producing pharmaceuticals, established the Novartis company. Located in Basle, Switzerland, Novartis positions Gerber as a primary member of its consumer health division.

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

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went into the food and the processes involved in manufacturing it. This was one of the company's first steps toward committing to quality.

While Gerber's quality systems have undergone several improvements over the years, teamwork was "one of the biggest things to hit quality at Gerber," says George Sheffier, a retired, 35-year Gerber veteran. He believes that fostering a team atmosphere taught Gerber how to help employees adjust to change, gave the company 'a head start on the diversity issues of the '90s and was critical when Gerber began spreading quality techniques throughout its plants.

Gerber experimented with teams in the '70s but by the end of the decade felt the company still lacked the benefits a solid team atmosphere provided. An attempt to implement the concept to a more intense degree in 1983 was met by employee skepticism. Realizing that management and supervisors were themselves having a difficult time adjusting to the team methodology, Gerber hired consultants to teach facilitation skills. Soon supervisors were holding meetings not only to familiarize workers with the team concept but to discuss change -- how employees felt about it and what the company could do to help make it easier. As employees began feeling more comfortable working in teams, they voiced concerns about trouble spots in systems and processes. Gerber also learned that the team atmosphere was a necessity in linking quality to every process in the company.

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

As quality became more widespread through the organization, Gerber needed to teach basic quality tools to its front-fine operators. As with the team concept, however,

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

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

What Gerber found was that it needed a system allowing consumers to contact it directly with suggestions, complaints and questions pertaining to Gerber products or infant care in general. Gerber's consumer relations department, established and operated by Dorothy Gerber in 1938, continued to receive a steady flow of letters, but the system wasn't timely and the feedback wasn't closely tied to either the quality or the safety department. Consequently, Gerber opened its telephone information service (800-4-GERBER) in 1986. The system provided a notable change for the company's

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quality discipline as it allowed telephone operators to log customer information into a database. In turn, trend analysis could be conducted and consumer demands could be integrated into the product development process. Because parents are up with their infants throughout the night, the company extended the department's operating hours in 1991, capturing information 24 hours a day. Gerber takes a daily average of 2,400 calls, accommodating all languages, and employs a team of letter correspondents to answer the 45,000 letters it receives yearly.

The company has often demonstrated innovative and creative thinking, notably in its plan to eliminate pesticides from its foods. By thinking outside the box, Gerber was able to outshine its competition, exceed customer expectations and prepare itself for future government requirements. In 1996, the U.S. Department of Agriculture (USDA) reconsidered the methods traditionally used to ensure food safety -- spot checks of manufacturing conditions and random sampling of final products -- and released its Hazard Analysis and Critical Control Point (HACCP) program. The program enforces principles such as analyzing all potential hazards associated with foods, identifying critical control points where hazards can be eliminated, and establishing procedures to monitor control points and verify properly working systems. The FDA and the USDA believed such guidelines would be proactive in stopping contaminated products from getting into the market.

Gerber came to the same conclusion--49 years earlier. In 1947 Gerber management came to believe that the best way to ensure the safety of its product was to control as much of the food-making process as possible. At that time the company began forming alliances with its growers, giving Gerber better control of produce cultivation and allowing it to keep track of the pesticides growers used. By the 1950s, Gerber had implemented a HACCP-like approach to its manufacturing process identifying critical control points and thus making its processes preventive rather than reactive. The Gerber product analysis laboratories were formed in 1963 to provide data on the composition of ingredients, monitor the quality of internal and external water sources and provide the analytical information needed to establish food formulations. The company also created procedures to monitor potential hazards and ensured correctly functioning processes by employing a thermal processing staff. The staff was to determine the amount of time a

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product needs to be cooked to become commercially sterile, conduct audits of production facilities to ensure that processing equipment was operating correctly, and review and improve thermal processing systems. The thermal processing staff grew so large that it became its own department in 1994, and it continues to work closely with Gerber's quality and safety departments today.

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

Key Issues for Discussion

1. How do the various definitions of quality discussed in Chapter 1 relate to the quality practices at Gerber?
2. How does Gerber exhibit the fundamental principles of total quality – customer and stakeholder focus, participation and teamwork, and a process focus and continuous improvement?
3. How did quality help Gerber overcome the crisis it faced in the consumer-tampering situation? What lessons does this have for other companies?

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[i] Adapted from Mark R. Hagen, "Quality for the Long Haul at Gerber," Quality Progress, 33, 2, February 2000, 29-34.

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