

SECOND EDITION

Total Quality MANAGEMENT

Text, Cases and Readings

Joel E. Ross

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Joel E. Ross

Florida Atlantic University
Boca Raton, Florida

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PREFACE

Since the publication of the first edition of this book, interest in and acceptance of TQM has accelerated around the world. It is now widely agreed that quality in products and services is a prerequisite for becoming a player in domestic and global markets.

The first edition of this book has been adopted by over 200 colleges and universities for courses in the topic. Many organizations and individual managers are using it as well. This reflects the growing recognition of the need to train and educate for quality management in all types of organizations.

This edition has been thoroughly revised, updated, and greatly expanded. The original seven chapters now number twelve and include additional textual material and examples. Extensive references are included at the end of each chapter. Five new chapters are presented:

- Organizing for Total Quality Management: Structure and Teams
- Benchmarking
- Productivity, Quality, and Reengineering
- The Cost of Quality
- ISO 9000: Universal Standards of Quality

New cases and readings have been added. The Varifilm case is an extensive comprehensive study that illustrates good and not so good practices. This is the 1993 case used by the Baldrige Award organization in preparing examiners to visit and evaluate companies that apply for that award. Each chapter contains an exercise which requires the reader to apply TQM principles to the practices contained in the comprehensive case.

Discussion questions, exercises, cases, and readings support the textual material. Together these tools provide reinforcement so that the reader is able to understand the principles and can apply them in practice.

The book is practical yet based on sound principles. It is not about the “hard” science of statistical quality control, although this topic is treated along with the other applied tools and techniques that are necessary for implementation of a quality program. It is an excellent text for college students as well as for organizational development programs directed to practitioners who are responsible for developing and implementing TQM programs in their own organizations, whether in manufacturing or service firms.

AUTHOR

Dr. Joel Ross is Senior Professor of Management at Florida Atlantic University in Boca Raton, Florida. He graduated from Yale University and received his doctorate in business administration from George Washington University. He has been Chairman of Management and Director of the MBA Program. Prior to his academic career, Dr. Ross was a Commander in the U.S. Navy.

Dr. Ross is widely known as a platform speaker, seminar leader, consultant, and author. He has developed and conducted management development programs for over one hundred companies and organizations in the areas of general management, strategy, productivity, and quality. He has been an invited lecturer on management topics in Israel, South Africa, Venezuela, Panama, India, Ecuador, the Philippines, and Japan.

His articles have appeared in such journals as *Journal of Systems Management*, *Business Horizons*, *Long Range Planning*, *Industrial Management*, *Personnel*, *Management Accounting*, and *Academy of Management Review*. He is the author of thirteen books, including the landmark *Management Information Systems*, *People, Profits, and Productivity*, and *Total Quality Management*, which has been adopted by over 250 colleges and universities.

Dr. Ross has the reputation of being able to integrate academic principle with real-world practice.

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INTRODUCTION TO TOTAL QUALITY MANAGEMENT

Total quality management (TQM) is the integration of all functions and processes within an organization in order to achieve continuous improvement of the quality of goods and services. The goal is customer satisfaction.

Of all the management issues faced in the last decade, none has had the impact of or caused as much concern as quality in American products and services. A report by the Conference Board indicates that senior executives in the United States agree that the banner of total quality is essential to ensure competitiveness in global markets. Quality expert J. M. Juran calls it a major phenomenon in this age.¹ This concern for quality is not misplaced.

The interest in quality is due, in part, to foreign competition and the trade deficit.² Analysts estimate that the vast majority of United States businesses will continue to face strong competition from the Pacific Rim and the European Economic Community for the remainder of the 1990s and beyond.³ This comes in the face of a serious erosion of corporate America's ability to compete in global markets over the past 20 years.

The problem has not gone unnoticed by government officials, corporate executives, and the public at large. The concern of the President and Congress culminated in the enactment of the Malcolm Baldrige National Quality Improvement Act of 1987 (Public Law 100-107), which established an annual United States National Quality Award. The concern of business executives is reflected in their perceptions of quality. In a 1989 American Society for Quality Control

(ASQC) survey, 54 percent of executives rated quality of service as extremely critical and 51 percent rated quality of product as extremely critical.⁴ Seventy-four percent gave American-made products less than eight on a ten-point scale for quality. Similarly, a panel of Fortune 500 executives agreed that American products deserved no better than a grade of C+.

Public opinion regarding American-made products is somewhat less than enthusiastic. In a 1988 ASQC survey of consumer perceptions, less than one-half gave American products high marks for quality.⁵ Employees also have misgivings about quality in general and, more specifically, about quality in the companies in which they work. They believe that there is a significant gap between what their companies say and what they do. More importantly, employees believe that their talents, abilities, and energies are not being fully utilized for quality improvement.⁶

Despite the pessimism reflected by these groups, progress is being made. In a 1991 survey of American owners of Japanese-made cars, 32 percent indicated that their next purchase will be a domestic model, and the reason given most often was the improved quality of cars built in the United States.⁷ Ford's "Quality Is Job One" campaign may have been a contributing factor. There is also evidence that quality has become a competitive marketing strategy in the small business community, as Americans are beginning to shun mass-produced, poorly made, disposable products.

Other promising developments include the increasing acceptance of TQM as a philosophy of management and a way of company life. It is essential that this trend continue if American companies are to remain competitive in global markets. Customers are becoming more demanding and international competition more fierce. Companies that deliver quality will prosper in the next century.

THE CONCEPT OF TQM

TQM is based on a number of ideas. It means thinking about quality in terms of all functions of the enterprise and is a start-to-finish process that integrates interrelated functions at all levels. It is a systems approach that considers every interaction between the various elements of the organization. Thus, the overall effectiveness of the system is higher than the sum of the individual outputs from the subsystems. The subsystems include all the *organizational functions* in the life cycle of a product, such as (1) design, (2) planning, (3) production, (4) distribution, and (5) field service. The *management* subsystems also require integration, including (1) strategy with a customer focus, (2) the tools of quality, and (3) employee involvement (the linking process that integrates the whole). A corollary is that any product, process, or service can be improved, and a success-

ful organization is one that consciously seeks and exploits opportunities for improvement at all levels. The load-bearing structure is customer satisfaction. The watchword is *continuous improvement*.

Following an international conference in May 1990, the Conference Board summarized the key issues and terminology related to TQM:

- The **cost of quality** as the measure of non-quality (not meeting customer requirements) and a measure of how the quality process is progressing.
- A **cultural change** that appreciates the primary need to meet customer requirements, implements a management philosophy that acknowledges this emphasis, encourages employee involvement, and embraces the ethic of continuous improvement.
- **Enabling mechanisms of change**, including training and education, communication, recognition, management behavior, teamwork, and customer satisfaction programs.
- **Implementing TQM** by defining the mission, identifying the output, identifying the customers, negotiating customer requirements, developing a “supplier specification” that details customer objectives, and determining the activities required to fulfill those objectives.
- **Management behavior** that includes acting as role models, use of quality processes and tools, encouraging communication, sponsoring feedback activities, and fostering and providing a supporting environment.⁸

ANTECEDENTS OF MODERN QUALITY MANAGEMENT

Quality control as we know it probably had its beginnings in the factory system that developed following the Industrial Revolution. Production methods at that time were rudimentary at best. Products were made from non-standardized materials using non-standardized methods. The result was products of varying quality. The only real standards used were measures of dimensions, weight, and in some instances purity. The most common form of quality control was inspection by the purchaser, under the common law rule of *caveat emptor*.⁹

Much later, around the turn of this century, Frederick Taylor developed his system of scientific management, which emphasized productivity at the expense of quality. Centralized inspection departments were organized to check for quality at the end of the production line. An extreme example of this approach was the Hawthorne Works at Western Electric Company, which at its peak in 1928 employed 40,000 people in the manufacturing plant, 5,200 of whom were in the inspection department. The control of quality focused on final inspection of the manufactured product, and a number of techniques were developed to

enhance the inspection process. Most involved visual inspection or testing of the product following manufacture. Methods of statistical quality control and quality assurance were added later. Detecting manufacturing problems was the overriding focus. Top management moved away from the idea of managing to achieve quality and, furthermore, the work force had no stake in it. The concern was limited largely to the shop floor.

Traditional quality control measures were (and still are) designed as defense mechanisms to prevent failure or eliminate defects.¹⁰ Accountants were taught (and are still taught) that expenditures for defect prevention were justified only if they were less than the cost of failure. Of course, cost of failure was rarely computed. (Cost of quality is discussed further in Chapter 11.)¹¹

Following World War II, the quality of products produced in the United States declined as manufacturers tried to keep up with the demand for non-military goods that had not been produced during the war. It was during this period that a number of pioneers began to advance a methodology of quality control in manufacturing and to develop theories and practical techniques for improved quality. The most visible of these pioneers were W. Edwards Deming, Joseph M. Juran, Armand V. Feigenbaum, and Philip Crosby.¹² It was a great loss to the quality movement when Deming died in December 1993 at the age of 93.

THE QUALITY GURUS

Deming, the best known of the “early” pioneers, is credited with popularizing quality control in Japan in the early 1950s. Today he is regarded as a national hero in that country and is the father of the world-famous Deming Prize for Quality. He is best known for developing a system of statistical quality control, although his contribution goes substantially beyond those techniques.¹³ His philosophy begins with top management but maintains that a company must adopt the fourteen points of his system at all levels. He also believes that quality must be built into the product at all stages in order to achieve a high level of excellence. While it cannot be said that Deming is responsible for quality improvement in Japan or the United States, he has played a substantial role in increasing the visibility of the process and advancing an awareness of the need to improve.

Deming defines quality as a predictable degree of uniformity and dependability, at low costs and suited to the market. Deming teaches that 96 percent of variations have common causes and 4 percent have special causes. He views statistics as a management tool and relies on statistical process control as a means of managing variations in a process. Deming developed what is known as the Deming chain reaction; as quality improves, costs will decrease and productivity will increase, resulting in more jobs, greater market share, and long-term sur-

vival. Although it is the worker who will ultimately produce quality products, Deming stresses worker pride and satisfaction rather than the establishment of quantifiable goals. His overall approach focuses on improvement of the process, in that the system, rather than the worker, is the cause of process variation.

Deming's *universal fourteen points* for management are summarized as follows:

1. Create consistency of purpose with a plan.
2. Adopt the new philosophy of quality.
3. Cease dependence on mass inspection.
4. End the practice of choosing suppliers based solely on price.
5. Identify problems and work continuously to improve the system.
6. Adopt modern methods of training on the job.
7. Change the focus from production numbers (quantity) to quality.
8. Drive out fear.
9. Break down barriers between departments.
10. Stop requesting improved productivity without providing methods to achieve it.
11. Eliminate work standards that prescribe numerical quotas.
12. Remove barriers to pride of workmanship.
13. Institute vigorous education and retraining.
14. Create a structure in top management that will emphasize the preceding thirteen points every day.

Juran, like Deming, was invited to Japan in 1954 by the Union of Japanese Scientists and Engineers (JUSE). His lectures introduced the managerial dimensions of planning, organizing, and controlling and focused on the responsibility of management to achieve quality and the need for setting goals.¹⁴ Juran defines quality as *fitness for use* in terms of design, conformance, availability, safety, and field use. Thus, his concept more closely incorporates the point of view of the customer. He is prepared to measure everything and relies on systems and problem-solving techniques. Unlike Deming, he focuses on top-down management and technical methods rather than worker pride and satisfaction.

Juran's ten steps to quality improvement are

1. Build awareness of opportunities to improve.
2. Set goals for improvement.
3. Organize to reach goals.
4. Provide training.

5. Carry out projects to solve problems.
6. Report progress.
7. Give recognition.
8. Communicate results.
9. Keep score.
10. Maintain momentum by making annual improvement part of the regular systems and processes of the company.

Juran is the founder of the Juran Institute in Wilton, Connecticut. He promotes a concept known as Managing Business Process Quality, which is a technique for executing cross-functional quality improvement. Juran's contribution may, over the longer term, may be greater than Deming's because Juran has the broader concept, while Deming's focus on statistical process control is more technically oriented.¹⁵

Armand Feigenbaum, like Deming and Juran, achieved visibility through his work with the Japanese. Unlike the latter two, he used a total quality control approach that may very well be the forerunner of today's TQM. He promoted a system for integrating efforts to develop, maintain, and improve quality by the various groups in an organization. To do otherwise, according to Feigenbaum, would be to inspect for and control quality after the fact rather than build it in at an earlier stage of the process.

Philip Crosby, author of the popular book *Quality is Free*,¹⁶ may have achieved the greatest commercial success by promoting his views and founding the Quality College in Winter Park, Florida. He argues that poor quality in the average firm costs about 20 percent of revenues, most of which could be avoided by adopting good quality practices. His "absolutes" of quality are

- Quality is **defined** as conformance to requirements, not "goodness."
- The **system** for achieving quality is prevention, not appraisal.
- The performance **standard** is zero defects, not "that's close enough."
- The **measurement** of quality is the price of non-conformance, not indexes.¹⁷

Crosby stresses motivation and planning and does not dwell on statistical process control and the several problem-solving techniques of Deming and Juran. He states that quality is free because the small costs of prevention will always be lower than the costs of detection, correction, and failure. Like Deming, Crosby has his own *fourteen points*:

1. **Management commitment.** Top management must become convinced of the need for quality and must clearly communicate this to the entire