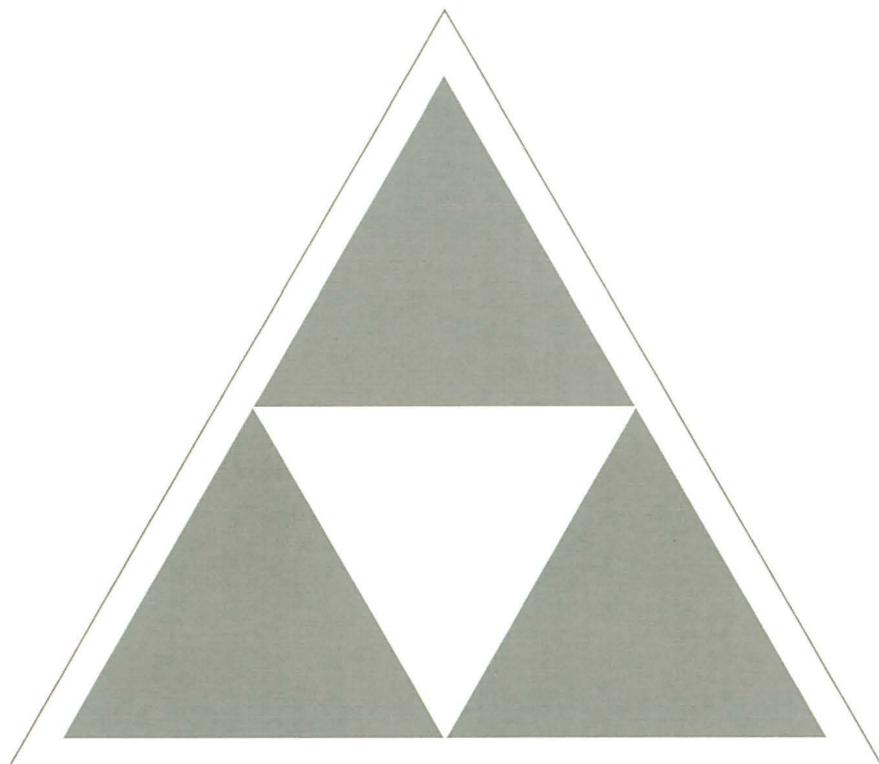


FOUR PRACTICAL REVOLUTIONS IN MANAGEMENT

SYSTEMS FOR CREATING
UNIQUE ORGANIZATIONAL CAPABILITY



SHOJI SHIBA

DAVID WALDEN

PRODUCTIVITY PRESS / THE CENTER FOR QUALITY OF MANAGEMENT

Four Practical Revolutions in Management

**Systems for Creating Unique
Organizational Capability**

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Systems for Creating Unique Organizational Capability

Shoji Shiba
David Walden

With Contributions by
Alan Graham, John Petrolini, and Many Others



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To Mieko and Sara

and

To the Memory of Our Dear Friend Tom Lee

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Preface

WHY THIS BOOK WAS ORIGINALLY WRITTEN

The first edition of this book, titled *A New American TQM—Four Practical Revolutions in Management*, was drafted in 1990–1992 and was published in 1993. We had several reasons for writing the book.

A variety of companies we knew needed practices, methods, and tools to provide increased customer satisfaction in a rapidly changing world. In particular, the seven founding member companies of the Center for Quality of Management (CQM) had such needs. Shoji Shiba had seen that companies that developed practices, methods, and tools to support *four revolutions in management*¹—customer focus, continuous improvement, total participation, and societal networking—seemed better able to maintain and increase customer satisfaction in the face of rapid change. In particular, their capabilities were enhanced when they treated the various activities as part of a system (perhaps a system unique to their company) for which over time they could understand the interactions between the parts of the system and improve the way the overall system operated. The book was written to help companies and their top management teams develop their systems, practices, methods, and tools in the four areas.

The book was aimed at senior management because broad business improvement works best when it starts at the top and is taken down to the rest of management and employees by a committed top management team. In particular, the book focused on issues of general management and treated narrow issues such as quality control very lightly.

Many books have been written on methods for business improvement, but far fewer provide the mix of theory, case studies, and detailed step-by-step methods that our book provided. On the one hand, our book provided tried-and-true methods; on the other hand, it also provided methods that were a half-step ahead of common practice. Also, the book did not take the viewpoint of any particular institution or individual; rather, it *synthesized* successful practices used around the world. Thus, the book could be read by those seeking state-of-the-art management concepts or those seeking something closer to an implementation manual of the best available methods.

All of these reasons for writing the first edition of the book continued to drive us as we developed the second edition of the book, and we emphasize some of them even more in the second edition, as described in the next section.

WHY AND HOW THE SECOND EDITION OF THIS BOOK CAME TO BE WRITTEN, AND ITS TITLE

Since publication in 1993, the first edition has sold and continues to sell well. However, since the book's genesis in 1990, much has changed in the world—especially in the United States for whose readers the book was primarily written—that demands this update, which we now publish under the title *Four Practical Revolutions in Management: Systems for Creating Unique Organizational Capability*.

Continuing evolution of business needs and business improvement methods.

The first edition of our book in 1993 was nominally about the why and the how of Total Quality Management (TQM). TQM by then had developed over nearly 40 years, first in the United States, then in Japan, and then again in the United States. Historically, TQM was focused on improving the quality of products and services and doing so with maximum efficiency. In other words, it was focused on quality assurance—the *management of quality*. Neither the first edition of this book nor this second edition puts much emphasis on this traditional focus of TQM on quality assurance. There are many other books on TQM narrowly defined as quality assurance.

By the time we drafted the first edition of this book the focus of the methods known as TQM was beginning to move from the *management of quality* to the *quality of management*—dealing with the ongoing improvement of the way an organization is managed in a rapidly changing world. Thus, the focus of our first edition was on management and not limited to product and service quality. In fact, shortly after the first edition was published in 1993, we began speaking and writing about TQM as Total Quality of Management rather than Total Quality Management; in the last several years, when we were trying to be precise, we began to speak of TQoM rather than TQM.

Nearly another decade has passed since we began to write the first edition, and the evolution of the problems organizations face has continued. Beyond assuring product and service quality and more generally continuing to improve the way they operate their business, many organizations find it necessary to redefine their business upon occasion. To these ends they need to create an appropriate management system or organization for their own situation. In fact, during the time since the first edition appeared, we have come to see the TQoM methods we were teaching as being aimed at helping a company create its appropriate *unique organizational capability*.

Also, over the past decade or two, organizations of every type have come to think of themselves more as businesses. Once upon a time only for-profit manufacturing and service companies were thought of as being *in business*. These days, at least in the United States, there is increasing pressure for government, the military, health care organizations, schools and colleges, charities, and even churches to operate in a more business-like fashion. There is loud complaint when the government of a state or a health care organization “does not operate like a business” or “is not accountable.”

In this new edition, we describe methods to address these new needs. In particular, we describe methods to address the needs of organizations (a) to have a dynamic

(not static) implementation strategy, (b) to plan for ongoing exploration and discovery and not just for execution, and (c) to diffuse improved capability not just within teams or within organizations but in a reinforcing way *among* individuals, teams, organizations, and across society. Addressing this combination of needs is a unique aspect of our book.

New case studies. The widespread use by companies of the methods described in the first edition, and newer methods since the first edition, has resulted in many new case studies being available for use in the second edition.

Emphasis on integration with other methods. The United States has had to suffer through another decade of the business press and business gurus declaring that one important management advance after another was first the panacea and then was dead. When this book was first written, TQM was the panacea, and then it was declared dead. Then came Business Process Reengineering and then Systems Thinking and Lean Production. Astonishingly, as this book is being revised, Six Sigma is becoming all the rage, as if it hadn't been a key component in Motorola's award-winning TQM implementation in the late 1980s. It is entirely natural that new business ideas get put forward. However, it is counterproductive to see them (especially to promote them) as being in conflict with each other or to see each new method replacing the older methods. Once one reconciles vocabulary differences, there is usually considerable overlap among the supposedly competing methods; and progress in all fields of human endeavor typically depends on newer methods building on or being added to the best parts of older methods. We believe that from the sets of management methods available, managers of companies must select the parts of each set that apply to their company and integrate them into a system appropriate for their company. We call this *designing integrated management systems*, and it is a thread that runs through this revision.

Dodging the uninformed perception that “TQM is dead.” Some managers and students of management believe that “TQM is dead.” Of course, the methods of TQM are very much alive. Many of the best companies use the methods of TQM, although in some cases they may not talk about them as being TQM. In fact, many TQM methods (for example, ongoing process improvement, customer focus, and employee involvement) have become so accepted that they are merely viewed as part of modern management, and companies that don’t use the methods will find themselves at a competitive disadvantage. And, as already mentioned, the methods continue to evolve and improve, often in synthesis with other “name methods.”

Nonetheless, so we can quickly move to teaching the use of the methods and avoid some of the distraction and mind set around “TQM is dead,” we decided to drop “TQM” from the book’s title. Without the ability to use TQM in the title, we now use as our title the old subtitle of the book, *Four Practical Revolutions in Management*, which alludes to the four areas of skill development covered in the first edition and in this new edition and that make up TQM or TQofM: customer focus, continuous improvement, total participation, and societal networking.

Changes in vocabulary. Therefore, TQM will be unavailable to us as an abbreviation for the principles, methods and practices contained in the four areas of skill development. Unfortunately, our newer version, TQofM, seems a little awkward and might still be confused with TQM. Therefore, in this book we will use words such as *to make organizational change*, *to do organizational learning*, *to do organizational improvement*, and *to implement organizational change and improvement* rather than *to implement TQM* or *implement TQofM*; and we will refer to *methods or practices of organizational change*, etc. rather than *methods or practices of TQM* or *TQofM*.

We will use *organizational change* and *organizational change and improvement* (not TQM) to refer to changing the total quality of management to develop an organization's unique capability. These organizational changes may be incremental improvements, breakthroughs from existing business practice, or the entrance into entirely new businesses.

In phrases such as "organizational change" we mean organization as a synonym for any business or non-profit entity such as a corporation, company, university, or society that might use the methods of this book to improve its overall management system. (In fact, much of the time we use *business* rather casually to refer to any for-profit or not-for-profit organization.)

Removing "American" from the title. The first edition of this book has been translated formally into Spanish, French, and Portuguese and has been used as a textbook in courses in the rest of Western Europe (particularly Germany) and Scandinavia (including Finland), Latin America, and in several Asian countries (including Japan). The book is also being translated and used in courses in China. Since the content of the book is not limited to use in the U.S., including the word *American* in the title was an unnecessary limitation and confusion.

Increased emphasis on the theme of systematic development of skill. The first edition of this book had a clear theme of the described methods being for the systematic development of skill in managers, teams, individuals, and organizations. The new edition puts greater emphasis on this theme and on systems for combining the several areas of skill development.

Supporting materials. The first edition of this book was used as the textbook for a variety of college and company training courses. In support of these courses, a parallel set of teaching material has been created, including step-by-step manuals on specific methods, quick reference cards, homework assignments, and in-class exercises. Some of these ancillary materials are included in the second edition and some are referenced. In addition, the *Journal of the Center for Quality of Management*, which was started in parallel with the drafting of the first edition of this book, has been publishing for nine years and is now on-line on the World Wide Web. This edition references a number of the papers and case studies in that on-line archive. Finally, we plan to have a Web site (www.cqm.org/4prim) in support of this book—at minimum, a list of errors and corrections.

What we have not changed. While we have dropped some case studies from the first edition, we have kept other old case studies. Good case studies can remain useful, even some that are a decade old and describe a company that no longer exists or operates in the same way. In general, we see case studies primarily as a way to illustrate practical use. We do not use case studies to *prove* the validity of a method. Good methods can fail. Bad methods can succeed. What works at one time may fail at another time, for a variety of reasons.

Although we have dropped TQM from the title of this second edition, we still use *TQM* in some examples, when the people involved thought of themselves as implementing TQM.

Despite economic problems in Japan in the 1990s and the buoyant U.S. economy during the same period, we have also kept many of the comparisons between the Japanese approach to business improvement since the advent of TQM in Japan versus the traditional U.S. pre-TQM approach to business. The Japanese approach significantly informed the approach now used by many of the best U.S. companies, which continue to benefit from using the methods.

This second edition is *still* intended to be a textbook for college courses and courses outside of colleges aimed at executives and managers. It is also intended to be read and referenced by CEOs and other organizational change agents who are engaged in improving the way their organizations (however large or small) operate. We aim to provide more than motivation for change and pat answers for how to accomplish change. We are trying to provide enough theory, practical methods, and examples to enable readers to develop their own theories for the future structure and processes of their organizations, to try them in their organizations, and over time to make them work. To support the practical use of the content of our book, we include many references to related works, both to provide pointers to additional information and to acknowledge our sources.

What we have not added. The environmental changes that may be having the biggest effect on the way business is practiced involve the Internet, World Wide Web, microcomputers available everywhere, and other electronic technology and infrastructure. A book needs to be written called *Managing in the Information Age*. Unfortunately, we will not be able to address that need here.

Second edition authors. Since the first edition was published, Shoji Shiba and David Walden have remained actively involved in developing and teaching the content of this book, while our colleague and friend Alan Graham has gone on to other interests. Thus, it was natural that this second edition be authored by the two of us.

ORGANIZATION OF THE SECOND EDITION

As with the first edition, this edition is divided into five parts: an introductory section, followed by a section on each of the Four Practical Management Revolutions of the title, as shown in the following table.

Introduction: Business Evolution	3 chapters
The First Revolution: Customer Focus	2 chapters
The Second Revolution: Continuous Improvement	9 chapters
The Third Revolution: Total Participation	13 chapters
The Fourth Revolution: Societal Networking	2 chapters

The Four Practical Revolutions are:

1. Customer focus—the need and means to pay attention to customers to know what to improve
2. Continuous improvement—the need and means to continue to improve
3. Total participation—the need and means to engage appropriate people throughout the organization in improvement activities and to obtain their particular knowledge and capabilities so that peoples' efforts help rather than hinder
4. Societal networking—the benefit and means of sharing good management practices with others, so that all can improve more rapidly

Each of the five sections of the book has a somewhat expanded number of chapters from the first edition. Specific methods relating to each of the four practical revolutions are described.

As can be seen in the table above, the book has many more chapters on continuous improvement and total participation than on customer focus and on societal networking. Continuing to improve the organization and expanding participation in the improvement are what an organization can do for itself. The customers and other organizations are external influences that motivate and support continuous improvement and increased participation.

In the first edition of this book, we waited until the beginning of the section on total participation to begin to introduce the methods of mobilizing people in the organization to participate in improvement activities. In teaching the content of the book, waiting this long has proved problematic—people cannot concentrate on learning the content for customer focus and continuous improvement because of their concern that it will be impossible to mobilize use of the methods in their organizations. Thus, in this edition, we begin presenting case studies of mobilization from nearly the beginning of the book.

We wait until the part of the book on mobilization to present a *general model* for mobilization. There we also summarize the relevance to the general model of the case studies presented earlier in the book. Finally, we present additional case studies of mobilization, and some more theory.

Order of Reading

For consistency with the first edition of this book and to highlight early on the importance of customer focus we present the four revolutions in the order listed above.

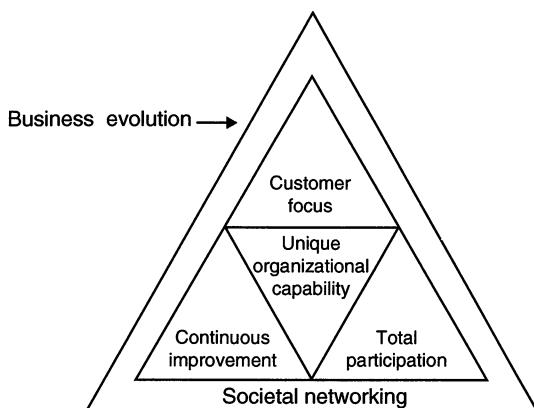
However, reversing the first two revolutions might be a more appropriate order of presentation, since historically the methods of continuous improvement were used to discover the need for and methods of customer focus. On the other hand, if we introduced continuous improvement first, we would not want to cover all of the material in the seven chapters of the book (Chapters 6 to 12) on continuous improvement before introducing customer focus (Chapters 4 and 5). In fact, we often teach the content of this book in the following order:

- Chapter 6: an introduction to continuous improvement
- Chapter 4: an introduction to customer focus
- Chapter 5: on some challenges of customer focus
- Chapters 7 to 12: details of specific methods of continuous improvement, many of which include a customer focus component

That could also be a sensible order of reading.

Iconography

Throughout the book we use variations of the following figure to help readers keep track of which section of the book they are in.



The meaning of the figure is that the evolution of business requires activity relating to each of the four revolutions—customer focus, continuous improvement, total participation, and societal networking (which accelerates efforts of the previous three revolutions). All of these activities taken together help a business develop its unique organizational capability.

Shoji Shiba
David Walden

NOTES

1. The phrase “revolutions in management” comes from Kaoru Ishikawa, in many ways a father of Japanese TQM, whose motivation for working at TQM was to “accomplish a revitalization of industry and effect a thought revolution in management” [147, Chapter 6].

Acknowledgments

SECOND EDITION CONTRIBUTIONS

A number of people have made contributions to this book. The contributions of Alan Graham, our co-author for the first edition of this book, are inseparable from the content of the second edition. John Petrolini, of Teradyne, has taught us much over the years about the Teradyne approach to management. In particular, he allowed us to use the set of Teradyne case studies that run throughout this book, including text and figures, even though he may include extended versions of this content in a monograph of his on the Teradyne TQM story. We have learned much from other individuals in many companies, but no one else has contributed as much to our understanding and to this edition.

The founding and current presidents of the Center for Quality of Management (CQM), Tom Lee and Gary Burchill, have been our collaborators in many activities we have drawn on for this book. They also were supportive of the writing of this book. We are privileged to be able to say that Tom and Gary are our colleagues and friends.

The first edition of this book has been used as the textbook of course 15.766 at MIT for a number of years. Business people who presented case studies for the MIT course that influenced this edition were Alex d'Arbelof, Rodger Dowdell, Warren Harkness, Brad Harrington, Brad Nelson, John Petrolini, Paul Snyder, Bob Stasey, Ray Stata, and Goodloe Suttler. Case studies from David Lowe and Fred Schwettmann were sketched for the MIT students by the authors of this book. Teaching assistants for the MIT course included Tonia Chu, Alvaro Cuervo-Cazurra, Martin Hahn, and Greg Scott. We also appreciate the participation and feedback of the 15.766 students from the Leaders in Manufacturing Program, the System Design Management Program, and other parts of Sloan School of Management and MIT.

We have also taught the content of this book in a variety of CQM courses, on two occasions at the ADL School of Management, and in other schools and programs. We appreciate the participation and feedback of the students of those courses.

Ira Moskowitz and Ken Bethea described to us their experience with self-directed work teams in their division at Analog Devices. Jeff Swift described to us his experience with core teams in his division at Analog Devices. Alex d'Arbelof told us about Teledyne Aurora. Bob Stasey provided a case study of hoshin management. Chris Mastro, Doug Mader, Marty Miller, Michael Carter, Yogesh Parikh, Trent Guerrero, Andrea Vlasak, Asoka Verravagu, and Rajesh Srinivasan provided insight, and pointers to people with insight, about the current state of Six Sigma practice.

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At the same time this book was being revised, the authors of this book, Shoji Shiba and David Walden, were simultaneously involved in the writing of another book [186]. In particular, David Walden provided draft text to the preface, a chapter and two appendices of that book that also served as draft text for this book. Some of that text came from a paper drafted in 1994 and 1995 by Thomas Lee and David Walden [187], which was heavily influenced by the thinking of Russ Ackoff. For this book, we also interviewed some of the same people interviewed for that book. While the vast majority of [186] (to which Chris Bergonzi also contributed) is different than this book, similar or the same figures and words, sentences or paragraphs may appear in the parallel sections of the two books.

We have included extensive footnotes and references, directing readers to original sources and attempting to properly acknowledge colleagues and authors from whom we have learned. However, as we have lectured over the years on the content of this book, some ideas and even phrases of others may have become so familiar that we now do not recognize them as other than our own. If you spot something that you think should be acknowledged to someone else and isn’t, please let the second author know so we can consider making an appropriate correction in future printings.

FIRST EDITION CONTRIBUTORS

In creating the second edition, we are very grateful for the contributions to the first edition: they formed the basic structure and provide much continuing content of the second edition.

Most of all, we appreciate the great contributions of Alan Graham, our co-author for the first edition.

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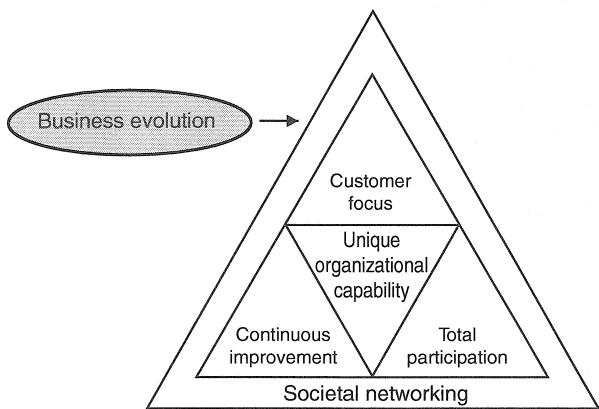
We hasten to acknowledge the remarkable ability of the MIT community to bring people and knowledge together. CQM co-founders Tom Lee, Ray Stata, and Shoji Shiba connected in one way or another through MIT. The preliminary content of the book was taught at MIT which influenced the final form of the book. There are other synergies with MIT too numerous to mention.

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Introduction: BUSINESS EVOLUTION



This introductory portion of the book provides motivation and background for the presentation of the methods of the Four Practical Revolutions of Management described in the rest of the book.

Chapter 1—The Evolution of the Customer Satisfaction Concept

- Sketches the evolution of expectations over the course of the twentieth century for customer satisfaction or quality, which has driven the speed of business change and the need for more efficient methods of business improvement.
- Describes the evolution of methods needed to address the changing expectations for customer satisfaction or quality.

Chapter 2—Survival in a Rapidly Changing World

- Describes how rapid change in business requires changes in the way we think about management:
 - A systematic approach to developing individual and organizational skill
 - Treating management as a system
 - Dealing with people and their purposes
 - Integrating best practices

Chapter 3—Developing a Unique Organizational Capability

- Introduces the Four Practical Revolutions in Management and the rest of the book.

1

The Evolution of the Customer Satisfaction Concept

As we begin the third millennium, many people trying to manage organizations have a feeling that things are moving faster and faster and that it is more and more difficult to survive in business. Of course, this feeling is not new. Each generation feels things are moving faster, and each generation has been right. A major source of this increase in difficulty has come from an evolution in the meaning of customer satisfaction over the course of the twentieth century.

Customer satisfaction and quality can be thought of as two different names for the same thing. When customers are asked to define what quality means to them, in general what they mean is what it takes to satisfy them. Thus, in this chapter and the rest of the book we will use the words customer satisfaction and quality more or less interchangeably.

In this chapter, we relate a history of how customers and businesses have thought about customer satisfaction, focusing particularly on an explicit model, known as the *four fitnesses*, for how customer satisfaction has evolved.

1.1 WHAT IS CUSTOMER SATISFACTION?

What is customer satisfaction? (Or, what is quality?) This is a multifaceted question, difficult to address in the abstract. It is easier to understand what is meant by customer satisfaction by considering the evolution of its meaning in leading companies. In the United States and Europe, quality control of one sort or another has been part of manufacturing for more than a hundred years, and the use of various quality concepts has come and gone and come again. By contrast, in Japan quality control was not significant until after World War II; since then, however, progress has been relatively rapid and uniform.

At the beginning of the evolutionary process, customer satisfaction or quality of any kind is not noticed or measured. Goods are produced and shipped. If customers

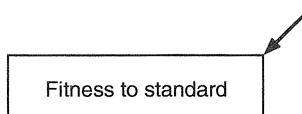
want to send something back, they do so—end of story. This situation characterized Japanese companies in the early 1950s, when “made in Japan” meant shoddy, unreliable goods.

In the rest of this section we trace the evolution of company efforts to improve customer satisfaction by describing the *four fitnesses*—levels of quality or stages of evolution of customer satisfaction—and their weaknesses.

The four fitnesses are:

- Fitness to standard
- Fitness to use
- Fitness of cost
- Fitness to latent requirement²

Quality Concept 1: Fitness to Standard



Fitness to standard evaluates whether a product built as described in the manual passes the standard. In other words, fitness to standard defines quality as the product that does what the designers intend it to do. Determining whether a product meets fitness to standard is mainly a question of inspection: does the product pass or not? To achieve fitness to standard, managers and engineers define each manufacturing task, record those tasks as standard practices in manuals, and define inspection procedures to enforce the standard practices. To evaluate fitness to standard, companies sometimes use the concept of statistical quality control (SQC), an approach the American quality expert W. E. Deming brought to Japan in the early 1950s.

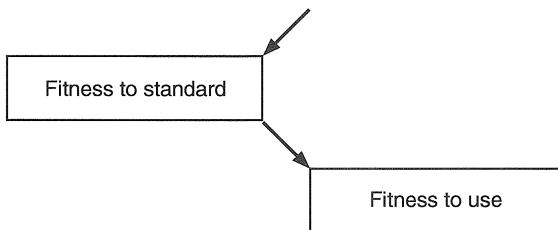
When considered from a modern-day rather than a historical perspective, fitness to standard used alone as a definition of quality has two weaknesses.

The first is the notion that quality can be achieved through inspection. According to fitness to standard, you assure quality by inspecting the output of a manufacturing process and culling out and discarding the defective or low-quality items. In reality, however, this process often leads to an adversarial relationship between those who make a product and those who inspect it. Professor Shiba tells of a case in which the factory manager proudly described to him his factory’s excellent inspection system, emphasizing that the inspection function was completely separate from the rest of the plant; indeed, the inspectors were government employees, not plant employees. When Professor Shiba talked to the workers, however, he learned that they considered the inspectors to be the enemy.

The second weakness of fitness to standard is its neglect of market needs. Creation of production standards and inspection geared to these standards orients

people to the product and whether it does what it was designed to do, rather than to the needs of customers and whether the product fills those needs. Acting to correct this weakness brought leading Japanese companies to the next level of quality in the early 1960s.

Quality Concept 2: Fitness to Use



Fitness to use means to assure satisfaction of market needs. Can the product be used as the customers want to use it? For instance, a tool company makes screwdrivers to turn a certain size screw. For many users, their real need is to have the tool turn whatever size screw they have and also to open a can of paint. (The Sears Craftsman Tools no-questions-asked guarantee may have been an attempt to promise fitness to use.) It is not easy to forecast the diverse usage of the market, as the following amusing example from Japan illustrates.

A major appliance company made a new washing machine. However, there were many complaints about it from the customers living in rural areas. The company sent its engineers to the field to observe. They found that farmers were using the machines to wash the dirt off potatoes. Although such use wasn't prohibited by the manual, the machines weren't designed for such dense loads, and they would often break. When the manufacturer realized the use to which customers were actually putting the machines, the machine was redesigned to tolerate potato washing, and the machines returned to normal reliability. Fitness to use addresses the real needs or desires of the customer, not just the standards set by the producer.

As was the case with fitness to standard, fitness to use is achieved by inspection. Thus, a certain amount of conflict between inspectors and workers arises. Further, if the company wants products that can be absolutely counted on to perform as expected, that is, to have high fitness to use, then inspectors must rigorously reject products that deviate from the standard.

Any production process has variability from one unit to the next. Not all cars that come off an assembly line have exactly the same horsepower. Some bottles of soda will have caps too small, so that they don't quite stay on. Other bottles will have caps that leak because they are too large. Extremes on one or both sides of the standard must be rejected and reworked or thrown away.

Figure 1-1 illustrates this principle. The upper curve shows the statistical variation in some product characteristic such as horsepower, size of bottle cap, or amount of ice cream in the cone at an ice cream parlor. The products with characteristics beyond the acceptable tolerances must be rejected, which is a costly approach. As shown in the lower curve, if higher quality is desired, the inspection limits must be narrowed so that even more items are rejected, which is even more costly.

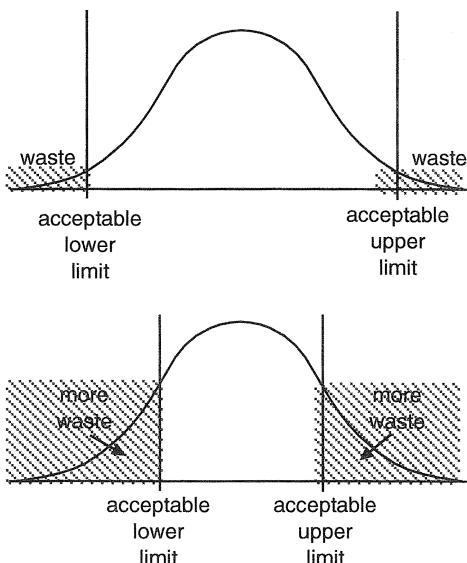
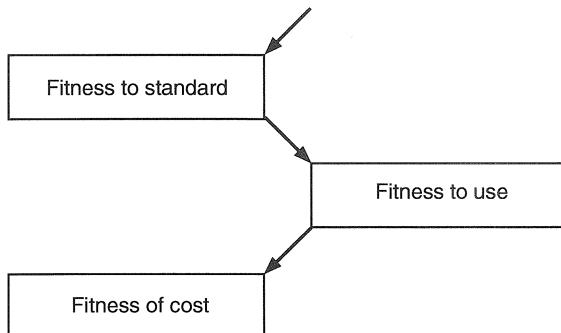


Figure 1-1. Statistical Variation in Product Characteristics

Another weakness of focusing on fitness to use is that use-based competitive advantage is tenuous. If a company has clearly understood fitness to use (meeting the needs of users), it may gain a monopoly position, so that it can charge prices high enough to compensate for the higher cost of higher quality through inspection. Competitors offering equally good products for cheaper prices quickly spring up, eliminating the monopoly position and the ability to offset costs incurred during the inspection process. For instance, from 1960 to 1970, a major Japanese camera company monopolized its market and charged high prices. But then the competition for cameras in Japan became fierce; sales of this camera company went down, and those of other brands went up. The camera company lost much of its market share in Japan.

Moving away from the high costs of “inspecting quality in” and toward “building quality in” brought leading Japanese companies during the early 1970s to the next level of quality.

Quality Concept 3: Fitness of Cost



Fitness of cost means high quality *and* low cost. These are the two most universal requirements for virtually all customers, products, and services. To achieve cost reduction while maintaining high quality (with no products outside the bounds), a business must reduce the variability of the production process, so that all units produced are already within the inspection limits and none have to be discarded (see Figure 1-2).

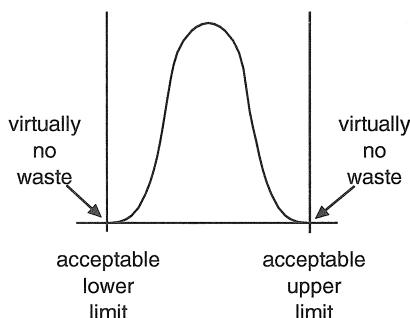


Figure 1-2. Reduced Variation Reduces Waste

A company seeking 100 percent quality without culling requires feedback and correction at each step rather than just at the end of the production process. To achieve this level of quality, it must completely change the production system. Worker focus must shift from controlling the output through inspection to controlling the process (see Figure 1-3).

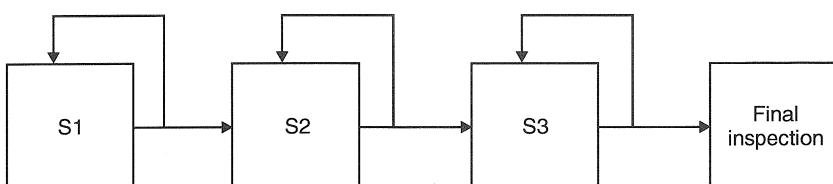


Figure 1-3. Feedback at Each Production Step

The modern methods to accomplish this shift are:

- Using statistical quality control
- Monitoring the process in addition to the output
- Providing for feedback at each step, whereby every line worker notices the work of his or her predecessor and can ensure that mistakes are corrected immediately
- Instituting line worker participation in the design and improvement of the production process to make it continuously more reliable

Workers are empowered to create this kind of continuous change through standardized, mass-taught tools and practices, such as the seven steps for quality control (7 QC steps, or 7 steps) and the seven tools for quality control (7 QC tools), which are described later (and are designated the 7 steps and 7 QC tools in this book).

However, a weakness remains. Companies that have achieved the quality level of fitness of cost are producing highly reliable, functional products at low cost. But competitors can create similarly reliable and inexpensive products. Newly industrialized countries can copy their skills of fitness to standard and fitness to use but have much cheaper labor, yielding low cost. This happened to Japan in the 1980s. Korea, Hong Kong, and Taiwan adopted Japanese technology, but had labor costs that were only one-half or two-thirds the Japanese cost.

For this weakness, the cure that leading Japanese companies began pursuing in a standardized way in the early 1980s was creating innovative products that would out-sell competitors' products. This raised product quality to the next level (described after the following subsection).

Two Formulas That Help in Thinking about Cost versus Price

Fitness of cost aims simultaneously at an improved product and a lower price (cost to the customer). This is in contrast to a typical viewpoint that a better product can demand a higher price.

The traditional more-features-provide-higher-prices view may be represented by the following formula.

$$\text{Cost} + \text{profit} \longrightarrow \text{price}$$

According to this formula, we develop the product that has the features we think are desirable and, to the cost of producing the product, we add our needed profit level to derive the price.

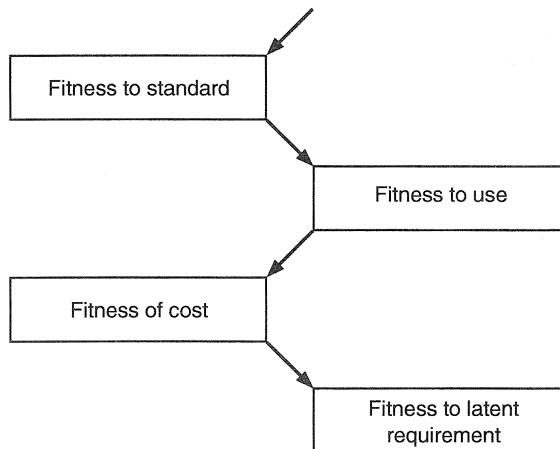
However, in many fields today, price is dropping as the product is improving. An obvious example is the personal computer business, where capacity and speed continue to increase and prices continue to decrease.

The fitness-of-cost approach may be represented by the following formula.

$$\text{Price} - \text{profit} \longrightarrow \text{cost}$$

According to this formula, the market (for instance, competitive pricing) sets the price for the features the market demands. From that we subtract our needed profit level and thus derive the cost of producing the product, including all necessary features.³

Quality Concept 4: Fitness to Latent Requirement



Fitness to latent requirement means meeting customer needs before customers are aware of those needs. If a company can find the latent requirement of the market, it may achieve a monopoly for a little while. The company can ask a higher price, which can be very profitable.

One of the most famous examples of a latent requirement occurred with the Polaroid Land camera. In 1944, while on vacation in Santa Fe, New Mexico, Edwin Land took a picture of his young daughter. She asked him why she had to wait to see the picture. On a solitary walk around Santa Fe, Land solved the puzzle implicit in her question, visualizing most of the requirements for a camera, film, and physical chemistry that permit what is now called instant photography.

A more recent example of a latent requirement is the Sony Walkman. This is a product we didn't know we needed, but as soon as it was available we found that our children couldn't walk or ride in the car without one, and the Walkman definitely improved the time we spent jogging and standing in grocery store lines.

The Great Leaps

The modern concept of how people thought about quality began with the shift to mass production and then evolved in three great leaps or revolutionary changes:

- To fitness to use—shift to mass production
- From fitness to standard to fitness to use—shift to the concept of market

- From fitness to use to fitness of cost—shift to the concept that the price is set in the market
- From fitness of cost to fitness to latent requirement—shift to the concepts of continuous change in market need and thus the continuous shortening of product development cycles

A Complete Example

Watches provide an example of all four levels of the quality concept:

- If a watch is put together with parts missing, it doesn't fit the standard. It must be thrown away or reworked.
- Watches must keep time to be fit for use. High-quality (accurate) chronometers of the eighteenth and nineteenth centuries were made of expensive components and were rigorously tested. Their cost was high, but they met the second quality standard. The classic mechanical Swiss watch of the twentieth century continued this tradition.
- Watches with electronics are both cheap and accurate, meeting the standard of fitness of cost. Many companies in many countries make such watches. Now watches can be had for under \$10 that are more accurate than the finest mechanical watches of the pre-electronic era, but competition is brutal.
- Fashion and individuality were introduced into the low-end watch market by Swatch, a Swiss company. Meeting these latent requirements allowed the company to charge more and make a higher profit than for commodity watches.

Companies Must Be Aware of All Four Fitnesses

Above we described the evolution of the concept of quality, in response to societal pressure, through the four fitnesses. However, companies today can't evolve through the four fitnesses in the historical order—it would take so many years that the company would lose competitively to pressures of companies already skilled in all four fitnesses.

Companies may not have to implement all four fitnesses for every product, and some companies may decide to focus on just some of the fitnesses. In general, however, companies today have to be aware of and probably implement the four fitnesses in parallel.

Companies must also avoid the mistake of thinking that the later fitnesses are higher or better than the earlier fitnesses and are thus worthy of greater attention. For instance, some product development people become fixated on fitness to latent requirement. In product development, companies must always address fitness to standard and probably need to address fitness of use and fitness of cost. They need to address only a few latent requirements.

Weaknesses can remain even in companies that systematically meet their customers' latent requirements. These weaknesses arise not from the companies' current processes for product and production process design, but from the variable speed and

appropriateness of improvement and change. Many companies are going out of business simply because they are not able to improve as quickly as their competitors. The tools and practices to address this weakness are discussed later in this book.

1.2 EVOLUTION OF CUSTOMER SATISFACTION METHODS

As the world changes, societal and economic forces drive the evolution of customer satisfaction or quality concepts *and* the tools and practices used to achieve them. Throughout the world people have intuitively understood and attempted to address the four fitnesses. Edwin Land's instant Polaroid photography, for example, addressed a latent requirement. His insight comprised both the concept and the means of its implementation.

However, intuition is often not sufficient. Therefore, we now describe the effort to create and diffuse a systematic quality improvement process. Standardized tools and practices were developed, deployed, and validated for each of the fitnesses and stages of the quality concept. These tools and practices were modified as corporations and their customers responded to the changes in the larger economy. We can expect to see further changes as competition develops along new dimensions and societal needs find new expression.

The evolution of methodology is summarized in Figure 1-4 and described in more detail in the following subsections.

Fitness to Standard → Fitness to Use

Standardization, statistical process control, and inspection were the main tools used to achieve fitness to standard. The consumer revolution and fitness to use brought a new tool: market research to find out what the customer wanted and cross-functional involvement to deliver it.

Fitness to Use → Fitness of Cost

At the next quality level, fitness of cost, the emphasis was on reducing costs while increasing quality (and, hence, on the need for low-variance production). Controlling and improving each production process, actively involving production workers, and developing the tools and practices suitable for a mass movement became necessary. Quality control circles (designated QC circles in this book) are described in Chapter 19. The 7 QC tools and the 7-step improvement process that uses them are listed in Table 1-1 and described in Chapter 9 (see also [181]).

Fitness of Cost → Fitness to Latent Requirement

The next level in quality methods added design value, with products developed to satisfy latent needs. The standardized means for accomplishing this new kind of quality are quality function deployment (QFD) and the 7 management and planning tools

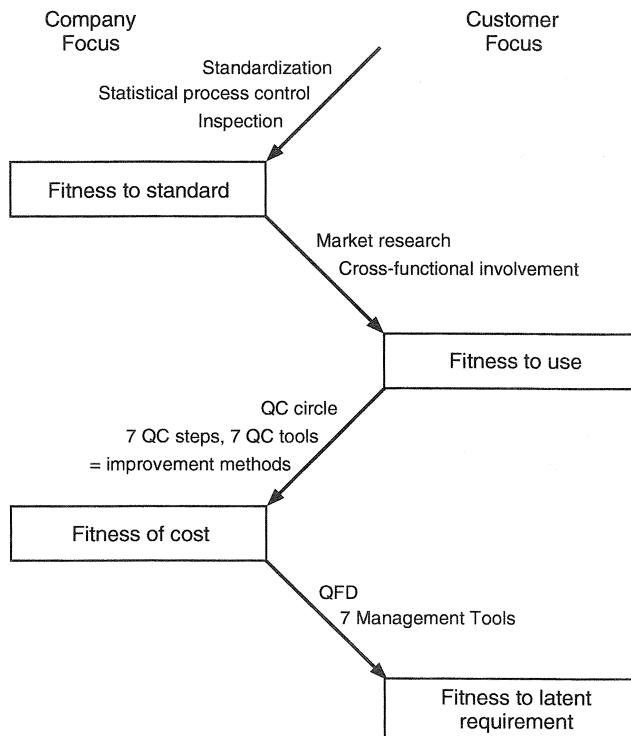


Figure 1-4. The Evolution of Methodology

(listed in Table 1-2 and described in Chapter 13). These tools help companies identify latent needs and translate those needs into plans for products and production processes. The term *management tools* is somewhat misleading because the tools are for engineers and staff people as well. Indeed, perhaps the most prominent and stan-

Table 1-1. The Tools and Steps of Quality Control

The 7 QC Tools	The 7 QC Steps
<ol style="list-style-type: none"> 1. Check sheet* 2. Pareto diagram 3. Cause-and-effect diagram 4. Graphs/Stratification 5. Control charts 6. Histogram 7. Scatter diagram 	<ol style="list-style-type: none"> 1. Select theme 2. Collect and analyze data 3. Analyze causes 4. Plan and implement solution 5. Evaluate effects 6. Standardize solution 7. Reflect on process (and next problem)

*Some companies include stratification or process flowcharts as one of the 7 QC tools instead of check sheet.

Table 1-2. The Seven Management and Planning Tools

1. Affinity diagram (KJ method)
2. Relations diagram
3. Matrix diagram
4. Tree diagram
5. Arrow diagram
6. PDPC
7. Matrix data analysis

dardized application of these tools is quality function deployment, which specifically forges a common understanding among marketing people, engineers, and managers.

1.3 EVOLUTION OF COMPANY INTEGRATION

As industrialization increased during the first half of the twentieth century, companies evolved from craft shops, with the entire staff in one room, into highly compartmentalized organizations. Such companies were capable of producing a few standard products with great efficiency. In the second half of the twentieth century, however, compartmentalization left companies unable to address the changing definition of quality; thus, a reintegration process began.

The integration of various parts of companies and their environments occurred as a result of successive innovations in business improvement and organizational learning. As Figure 1-5 suggests, the pattern of integration has alternated between vertical integration (lower parts better connected with upper parts) and horizontal integration (better connection of different functions, such as marketing, customers, or development).

Fitness to standard and fitness of cost are related to where quality improvement takes place in the vertical hierarchy of the company.

With fitness to standard came the hierarchical integration of engineering in which specifications were provided for the production line and the quality assurance department assured that the production line met those specifications. However, improvement work (by management and engineering) and routine work (by workers on the production line) remained strictly separated.

With fitness of cost came the imperative to focus on cost goals and to move information for improvement activities up and down the hierarchy. QC circles not only improved the way line workers did their routine work, but they revealed ways for managers and engineers to reduce cost through process changes and product design. Thus, production and improvement work were integrated at all levels of the organization.

Fitness to use and fitness to latent requirement have to do with how quality improvement takes place across an organization, that is, with horizontal integration.

Fitness to use required integration of all functions so that the company could provide quality in the customer's terms. Functions became interdependent: market research data had to be taken, the design and planning people had to design a product based on those data, production had to work from the design to make a product, sales

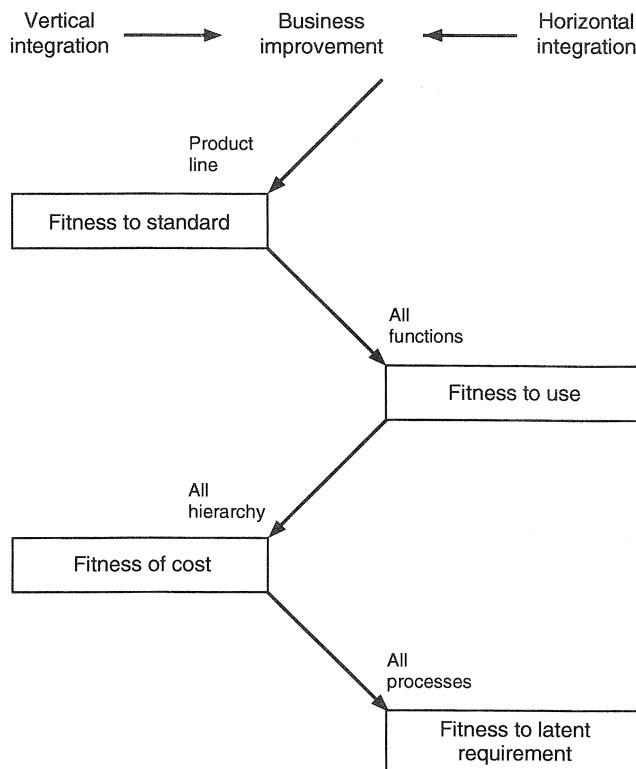


Figure 1-5. Horizontal and Vertical Integration Due to Successive Improvement Innovations

and support had to sell and deliver the product to the customer, and the cycle would be repeated (see Figure 1-6).⁴

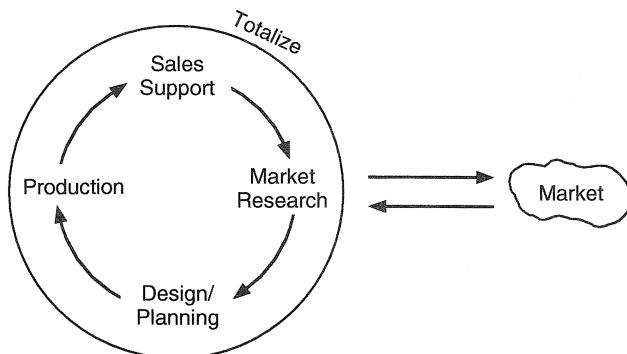


Figure 1-6. Total Integration of Company Functions

Fitness to latent requirement requires that processes be integrated. Integration of process has two meanings. First, it refers to integrating processes beyond the functional departments of the company (for example, customer processes used to identify anticipated needs) into the internal processes of the company. Second, it refers to extrapolating what is learned about processes in one area of the company to processes in other parts of the company so that the entire company may better anticipate customer needs.

Achieving fitness to latent requirement totalizes or systematically integrates quality practices across the customer's environment. Information about customer lifestyles and ways to improve them reach throughout the entire corporation.

1.4 CONTINUING EVOLUTION

Since the world is still rapidly changing, it is very likely that the concept of quality will continue to evolve and expand. In the 1993 edition, we suggested directions in which the definition of quality might evolve. Since 1993, we have seen signs of two new fitnesses becoming increasingly important, as shown in Figure 1-7.

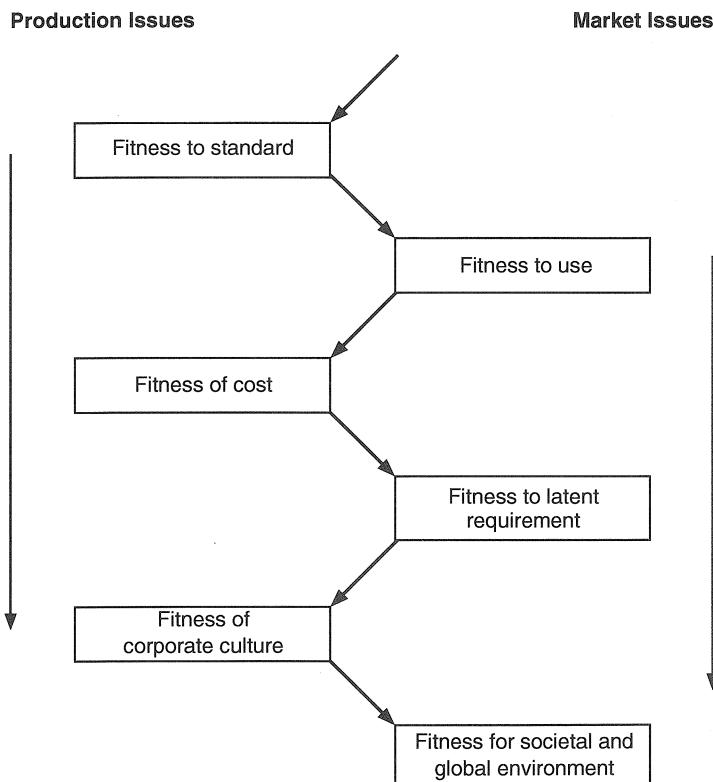


Figure 1-7. Two New Fitnesses

Fitness of corporate culture. Increasingly, companies are making decisions about products and promoting themselves on the basis of their corporate culture. For instance, NEC views itself as a company of computers and communications. We might call this fitness to corporate culture. Fitness to corporate culture fills out the stream of production from its starting point with the individual worker, through team efforts to address quality and cost simultaneously, to the product's place within the corporate strategy. This emphasis on corporate culture is needed for quick new product development in a rapidly changing business environment. We see this attitude in many Silicon Valley companies that emphasize the day-and-night schedules of their work, their living in "Internet time" (which purportedly runs several times faster than time in other industries), their entrepreneurial atmosphere, and so on.

Another example is from a Japanese maker of flexible panels for equipment which runs its business according to the "6-3-3-4 model": six months to develop a new product, three months to introduce the product to the market, three months of peak sales and production, and four months of product withdrawal from the market.

Fitness for societal and global environment. There is also increasing pressure for companies to improve the fitness of their work environment for employees and the fitness of their products and manufacturing processes for the surrounding environment, what might be called fitness for societal and global environment. This is a market-focused issue extending from fitness to latent requirement to include meeting the needs of the environment in which the customer lives. Note the increasing emphasis on the environmental standard known as ISO 1400.

Fitness for societal and global environment counter balances fitness to latent requirement. Fitness to latent requirement alone is not necessarily well suited to the long-term needs of society. For instance, many Information Systems managers in companies see frequent updates of computer software products by their vendors as too expensive and too disruptive. Planned obsolescence is now viewed as detrimental to the environment and the financial well-being of individual citizens.

A Consensus Next Fitness? More often than not when we ask our students what the next fitness will be, they say "fitness for all stakeholders in the organization"—moving beyond customers to include employees, owners, communities, and so on. Unfortunately, this proposed fitness does not fit neatly into our model of each new fitness alternating between production issues and market issues.

NOTES

1. For a thorough history of quality in the United States, see [110, Chapter 1].
2. The story of Japan's transformation from a situation where the term "made in Japan" meant shoddy goods to where it signified products of excellent quality is the story of the Japanese adoption and development of TQM. In fact, the four fitnesses characterize the four eras in the history of Japanese TQM through 1990. Since the different stages in the evolution of quality can be seen clearly in leading Japanese

companies more clearly than it can be seen in the U.S. or Europe, we frequently refer to the experience in Japan in describing the four fitnesses.

3. As with all models, these formulas are intended to be helpful but probably do not accurately deal with all possible situations. They do at least superficially apply to non-profit institutions if one sets profit to zero.
4. In fact, the *total* in *total quality management* originally meant integration of all company departments. Companies sought to “totalize” all divisions in order to unify efforts to satisfy customers.

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2

Survival in a Rapidly Changing World

Most people in business, people in all walks of life for that matter, have the feeling that these days things are moving faster and faster. In business, only a decade or two ago, we brought out a new product and expected to sell it for a few years. Today, managers of many companies feel that they have to bring out new products at a relentless pace of every few months, or they will be overwhelmed by competitors' products.

Of course, business has always seemed to be moving fast, at least against the pace of its time. However, there is no denying that today information and things can travel faster than ever before. Satellites broadcast ads for new products and services around the world, new fads spread worldwide practically overnight, and we can order a product from a Web site across the world and have it by international air courier tomorrow or the day after tomorrow.

There is also near constant talk about globalization and the global markets and a perception by many that more companies are operating more globally than every before.

Furthermore, after the downsizing decade, even in the booming U.S. economy of the 1990s, many of these companies are operating globally with a relatively thin management superstructure.

In 1998, the Center for Quality of Management, a non-profit consortium of over 100 companies in the U.S. and Europe, did a series of interviews with 18 U.S. and 11 European CEOs. Their list of key issues that they saw facing their companies and themselves included:

- To deal with increasing speed and complexity—speed of change, complexity of products, and complexity of physical and organizational geography
- To achieve timely thoughtful action—decision making in the face of complexity and uncertainty

In the face of this feeling that things are moving more quickly and becoming more complicated (and that there is simply too much to do each day), many managers, and management thinkers, feel that the traditional management methods most companies used for much of the twentieth century are no longer adequate for the job.

We are all familiar with these traditional management systems: lots of hierarchy and organizational boundaries, lots of explicit policies and procedures, management by exception, and so on. Many companies used these methods to great effect for many years. What has gone wrong with them now?

It seems to us that the traditional management methods developed in a relatively stable world (compared with today) and were primarily an optimization system (see Figure 2-1). In a relatively unchanging world, what worked one day could be expected to work again the next day. Thus, the traditional management methods evolved so they provided a *company optimization system*—optimizing current practice for delivery to a relatively steady world what had worked well in the past and seeing to it that the same steps were followed in the future.

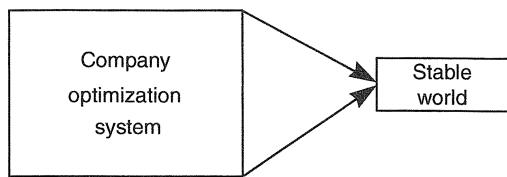


Figure 2-1. Traditional Methods Optimize Current Practice

In a more rapidly changing world, only optimizing what has worked in the past is insufficient—one needs a management system that is able to adapt to a changing environment. One needs an *organizational learning system* that is able to follow what is happening in a changing world environment and get feedback from it (see Figure 2-2).

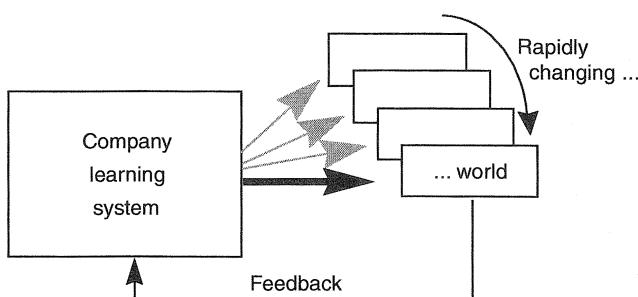


Figure 2-2. Need Methods to Adapt to Changing Environment

Unfortunately, obtaining such feedback is easier said than done. The traditional management systems—the company optimization systems—are aimed at doing the same thing repeatedly and thus tend not to dig for feedback on an ongoing basis. For instance, many of us may remember an instance when a customer did something “special” with a product we had sold to the customer (modified it or used it in a way we didn’t expect it to be used) and that was under maintenance. And our company reacted not by trying to learn about the limitations of the current product line indicated by the customer’s “special” actions; rather we canceled the warranty or maintenance contact on the product. In such instances, perhaps our customer maintenance management system was oriented to (and rewarded for) minimizing trouble calls rather than encouraging feedback about customer use of products. Many companies have such systems that don’t encourage feedback that could help the organization to adjust to a changing environment.

Principles of Management Thinking for Today

To build a company learning system that adapts to a changing environment requires some different principles of management than the principles that appear to have supported the traditional management methods of a company optimization system. We can see a glimmer of four new underlying principles by reviewing the evolution of the concept and methods of customer satisfaction, as described in Chapter 1. There we saw:

- Companies put in place methods that enabled them to improve their skill.
- Companies began to integrate the various parts of their organizations into a system able to accomplish more demanding tasks.
- There was effort by companies to engage the intelligent, motivated participation of their employees.
- Companies adopted new methods from many sources.

From those glimmers and much observation of companies over the last ten years, we arrive at four explicit principles for thinking about management in today’s rapidly changing world:

- Practice systematic development of skill
- Treat management as a coherent system
- Focus on people and their purposes
- Integrate best practices

We discuss each of these principles in some detail in the following four sections of this chapter. These principles are also highly relevant to the methods of the four revolutions in management thinking around which the main body of the book is organized, and they provide concepts and vocabulary we use in the rest of the book.

Note to reader. Some readers may prefer to skip directly to Chapter 3 and the main body of the book and to return to this chapter as necessary as they read the rest of the book. We make our students study this content now.

2.1 PRACTICE SYSTEMATIC DEVELOPMENT OF SKILL

Today's organizations need to improve their current performance and to evolve their means for future performance in response to changing business needs—they need to get better *and* get better at getting better. The question they must answer is *how* to get better and get better at getting better, in the most effective and efficient way—how to improve *systematically* rather than in a hit-and-miss fashion or in a fashion that is ineffective.

Before continuing to read, think for a moment what it means “systematically” (as opposed to “non-systematically”) to develop skill either individually or in an organization. Think about how you would characterize someone who has achieved mastery in a field or how you would characterize the process by which people achieve mastery in a field.¹

Note to reader: It might be useful for you to study a representative case study now. The case we recommend looking at first is that of the business known as NIMS. It is an old case study but an especially clear and compelling case study, and it begins on page 549. Over a multi-year period, NIMS systematically developed skill to meet the challenges of a rapidly changing world. NIMS developed a coherent system that met their specific needs drawing ideas from many sources.

Organizational Learning and Individual Learning

Though the goal of an organization is to improve the way it performs and to improve its ability to improve the way it performs, ultimately most improvement is individual: an organization cannot improve its ability to perform without the individuals in the organization improving the way they perform in their roles in the organization. Thus, individual learning is at the heart of organizational learning. Of course, individuals with improved skill also need to learn to perform better in the groups or teams that are required to carry out multi-person efforts. And at higher levels of the organization than the group or team—the department or division level—departments and divisions must learn better how to work together in the organization. This organizational learning may extend beyond the organization, to its suppliers, customers, strategic allies, and other business partners.

As we suggest in the prior paragraph and will describe in this book, organizational learning begins with personal learning and ultimately applies at all levels in the organization (individual, teams, divisions, whole organization, and partners beyond the organization) and to all people in the organization (individual contributors, first and middle level managers, and top managers and executives).

Phases of Skill Development

If we are going to study systematic skill development or organizational learning, it will be useful to consider the phases of skill development. In the next section we will

describe a simple model of the phases of skill development that we will use throughout this book. In this section we will note some other models that may prove useful in thinking about the process of skill development.

We all know how hard it is to get people (or ourselves) to learn a new skill. There is a reason for that. As shown in Figure 2-3, in any area of performance (physical or mental) in which we decide we need to improve, we may already perform with some degree of “skill” (by having “skill,” we mean one can perform that task without thinking about it, however poor one’s form may be). For instance, in a physical task such as swinging a golf club or tennis racket, through long repetition we may have really drilled an inefficient swing or stroke into our muscle memory so we can do it completely automatically. This is the stage of *unconscious incompetence* at the left bottom of the figure—our incompetent form is completely automatic to us.

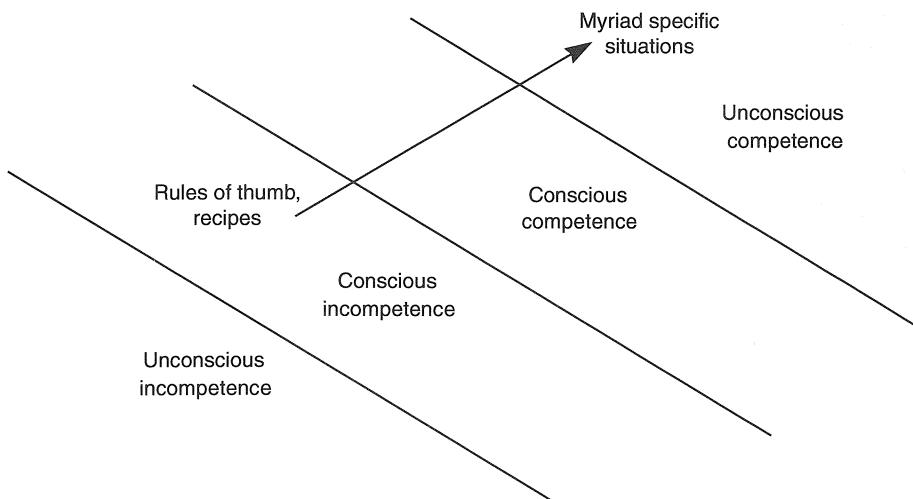


Figure 2-3. The Path to Skill

If we are going to improve, we typically move into a stage of *conscious incompetence*. An expert shows us the method of a new swing or stroke, and we have a hard time grasping it or a hard time doing it; in any case it feels awkward when we try to do it. “This doesn’t work for me,” is a typical first reaction.

If we persevere, over time we become better able to do the new swing or stroke and eventually it feels somewhat more comfortable. However, we are still very aware that this is a different way than we were used to, and maintaining proper form may require explicit concentration. It still feels awkward and uncomfortable, and we may still wonder if this is “right for me.” This is the stage of *conscious competence*.

Finally, with lots of practice, the new form is drilled into our muscle memory and feels so completely natural that we forget we are using this new method. This is the stage

of unconscious competence. In fact, for most significant tasks unless we can carry them out more or less unconsciously, we really aren't able to perform them usefully.²

With that model of skill development in mind, one can see why so many people resist improvement efforts. It requires going through the uncomfortable, awkward, and perhaps risky or scary phases of conscious incompetence and conscious competence. Figure 2-3 also illustrates another aspect of how we learn.³ In learning any new domain, we start with simplistic steps that in effect are “rules of thumb.” We learn a rule of thumb (literally) for holding a golf putter. We learn a rule of thumb doing simple subtraction. We use a rule of thumb for doing our first performance evaluation as a new manager. We learn rules of thumb as young engineers for writing what we hope will be maintainable software.

Of course, these rules of thumb are not sufficient for long-term success in the real, complex world. However, these rules of thumb do allow us to begin to perform at a rudimentary level. With experience at rudimentary performance and with further study (which may give us new, perhaps more complex rules of thumb), we have a chance to improve our level of skill. In time, with enough experience and study, we can learn exceptions to the rules of thumb, sets of rules of thumb to cover different situations, and (through even more experience) an unconscious intuitive feel for what needs to be done in particular situations.

In other words, skill development moves from conscious, usually awkward, application of rules of thumb, through conscious but increasingly fluid performance, and ultimately to an unconscious ability to handle myriad specific situations well.⁴ (In fact, a definition that some people use for skill is the ability to do something unconsciously.)

The fundamental issue of skill development is “reflective practice”—practicing a new method, reflecting on what one learned, and practicing again.

A Setting for Learning

Our model of learning and skill acquisition that we teach in our courses has the following three parts:⁵

$$1. \text{Information} + \text{commentary} \longrightarrow \text{knowledge}$$

When people talk about something they have read, the words they use tend to come right out of the information source; this is knowledge. If the subject contains pure facts, this way of learning can be quite useful.

$$2. \text{Knowledge} + \text{feedback} \longrightarrow \text{understanding}$$

You deepen knowledge into understanding by speaking about the subject (putting it in your own words) with someone who already understands it and by attempting to use the knowledge in different ways. In turn, the person who already knows the subject can correct any misunderstandings the learners might have and thereby enable them to deepen their mastery of the subject.

$$3. \text{Understanding} + \text{drive to use and schedule} \longrightarrow \text{skill}$$

Ideas have to be used and practiced before they become skills. It is a rare discipline in which a person can jump immediately from talking about something to doing it at a fully professional skill level, in a real setting for real stakes. In practice, developing a skill useful in actual situations takes both motivation—a powerful reason to use new skills instead of playing it safe—and a commitment to use the skills, which often takes the form of a schedule. Once a skill is developed, benefit can be given to the customer and money can be made.

People in corporations have a straightforward charter: Get the information, work to understand it in the training context, and then use it on the job for real problems, following actual schedules, and with actual management oversight. An effective method for carrying out this charter has been the “cascade” method. First managers learn the skills and teach them to their direct reports, who then use the skills and teach them to their direct reports, and so on. Xerox Corporation calls this process LUTI: learn, use, teach, inspect.

In the corporate setting, and for that matter in a university classroom, reading the book is only the first step. Results come from skill. Gaining skill requires commitment to three things: openness to learning, serious application, and mutual learning.

Commitment to Openness to Learning

The first step in developing a new skill is willingness to learn, and even before that the willingness to admit you don’t know.⁶

Several attitudes block openness to learning, and we ask students to commit themselves to giving these up. They are the following:

I Already Know It (IAKI). Knowing something is quite different both from having exposure to information and from possessing actual skill. IAKI must not become an excuse to tune out information and abandon the acquisition of skills.



Not Invented Here (NIH). It is easy to reject ideas and practices simply because they are new or foreign. Some practices are foreign to us in the sense that they are widely practiced in other countries, for instance, in Japan, and they are less used in the United States. Some practices seem foreign to people because they differ from their habitual styles of analysis and problem solving. Some practices may seem foreign because the examples given are from industries, functions, or situations other than the ones they work in. Many people proclaim their company’s situation to be unique, but this assertion is seldom true. Students of organizational improvement must make a commitment either to avoid NIH or to abandon this attitude if they now hold it.⁷



Prove It to Me (PITM). In junior high school, students don't have a vote on whether to include essay writing and spelling in the English curriculum, although some students do question the teacher about the usefulness of these activities. No one can guarantee that all the skills we learn will be essential to us in the future, and indeed, some things we learn may never be used. But much of what we learn in the English curriculum turns out to be valuable and applicable later.

The same is true of organizational improvement practices. Before they become skills, it is difficult to see how they will be applicable. Therefore students of organizational change must forswear the use of PITM as an obstacle to full participation in or full comprehension of the subject being taught. In American education, we are often taught to listen critically. But this may have been poor advice. A better approach is to listen empathetically and later to think critically. If you listen critically from the start, you may be so busy finding flaws that full comprehension eludes you. To understand a lesson, you must assume temporarily that what is being said is correct, so you may fully hear about it and understand it. Only then are you in a position to form alternative opinions about the subject being taught.



Not My Job (NMJ); We Could Never Do That (WCNDT). There is undoubtedly an unending list of such attitudes that one could list that prevent openness to learning, such as these next two. All such attitudes must be guarded against, and it is probably best to address them explicitly.



Following the Process. One school of academic thought encourages instructors to give minimal guidance to students, so the students can practice the skill of discovering things on their own. This idea has become somewhat embedded in American culture, so people are commonly expected to experiment with variations and try out shortcuts to learning on their own. This approach can speed the conversion of knowledge into understanding. At the stage where understanding is turned into skills, however, it is less useful. Encouraging individual variation at the beginning of the learning process slows down progress considerably and may engender bad habits that have to be unlearned.

Many of us have seen the unfortunate results of not following the initial process shown to us by a golf or tennis pro ("hold your thumb like this"), the instructions on a paint can ("finish all sanding before applying any paint"), or a cooking recipe ("stir continuously to avoid sticking to the pan").

A general maxim in quality control for engineering or marketing is to standardize routine tasks and avoid routine defects, so you can focus on being creative. For busi-

ness improvement methods, this means following the procedures closely at first and introducing variations only after the practices have become familiar to you. Trying to take shortcuts too early can undermine the learning process and interfere with getting useful results.

Commitment to Serious Application

Proficiency in organizational improvement skills cannot be achieved through study of the methods and examples in this book alone. Study must be accompanied by a well-organized sequence of applications to actual processes. For example, say a manager senses a problem and has some idea of what to do about it. Unless there is a common language for discussing improvement among the people who work for him, and unless the members of the group have some common experience of following the improvement process, it will be difficult for him to solve the problem or even to communicate its importance to his colleagues. Therefore, this book deals not only with concepts but with the applications for these concepts.

Aggressive Learning. Much of the material in this book concerns the development of skills. One skill often neglected in the training process is capturing and structuring information. Organizational change and business improvement cannot be practiced effectively with knowledge only. Understanding and skill are necessary, and these start with aggressive learning and listening. One example of aggressive listening is drawn from the section on management diagnoses of improvement activity: When improvement activities are being presented to management, at any point during the presentation, an aggressively listening manager will have a question or insightful observation. Simply listening passively to a presentation is not aggressive learning.

Another example is note-taking. Course materials in well-designed courses are closely linked to lectures and exercises. But reality doesn't come so neatly packaged, and neither does much new information. The material in this book may not always match that heard in a lecture course based on it, both because the written word is different from the spoken word and because the lectures are constantly being revised and improved.

Therefore, we ask participants in courses to develop the skill of copious, *verbatim note-taking*, in which they write down everything they hear. This activity will sharpen their focus on the information, preserve knowledge, and demonstrate interest and concern for the presenters. In addition, by disciplining themselves to take effective notes, the participants will acquire a useful skill.

Moving Forward. After we reviewed this list of commitments with the students in MIT's Leaders for Manufacturing program, we showed them a small ceremony, the "yo-one." The mechanics of the ceremony are simple: Once a task has been completed, everyone stands in a circle, so that they can all see each other. The leader starts by saying "yo-oh" (in two syllables). Other people join in, and then the group says the word "one" in a louder voice, and everyone claps their hands together once, simultaneously. The rhythm of this chant is approximately "one, two, THREE." A group needs only a couple of rehearsals to learn how to perform this ceremony.

The yo-one ceremony signifies completion and agreement. It is typically used when a phase of team activity is finished. Yo has no meaning, and one simply means one. The chanting of those words provides closure to an activity. The time just before the yo-one ceremony, when people are asking “are we ready to yo-one?” is explicitly designed to give people an opportunity to voice final doubts. If no one speaks up and the group goes ahead with the yo-one ceremony, everyone observes everyone else clearly and forcefully says yo-one and claps. Thus there is no doubt that all are unambiguously committed to making their work or their decision final. If someone attempts to reverse or rework a position, the group can remind that person firmly that he or she has “yo-oned” and is therefore violating a publicly made commitment. As an added value, a cheer at the end of hard work is invigorating and acknowledges a task successfully done. It makes people feel good.

The particular words used in the chant may differ according to corporate or national culture. One group of Chinese students used “Don’t go BACK!” which worked equally well. What matters is that the ceremony is always used and is mutually understood by the group. Learning to perform the yo-one ceremony is the class’s first work as a group; it is a micro-demonstration of commitment to move forward to real application.

Commitment to Mutual Learning

The traditional classroom learning environment, in which an instructor talks and students listen and then do homework, differs greatly from most learning environments on the job. In classrooms, students learn primarily from the instructor and from the teaching materials provided. Even much corporate training takes place in this manner. But the most common learning situation in work settings, and the one that the practices taught in this book support, is learning in groups in which no one is much more knowledgeable than the others. Therefore, this book emphasizes work in groups, whether on the job or in the classroom. In the approach we describe, reading is the only activity that each person undertakes alone from beginning to end.

2.2 TREAT MANAGEMENT AS A COHERENT SYSTEM

If you ask many managers what they do, they will tell you about the tasks they perform or functions they are involved in, such as going on sales calls, hiring and firing, and setting objectives. They will seldom tell you about how they have structured a management system for their company. In fact most companies have management structures that involve various functional organizations and various people performing their functional tasks, communicating around the organization in various ways, not because they have thought about the design of their management system but because they are replicating a set of functions, plans, reports and so on, that they (and all of us) are familiar with.

We believe that there is great power in taking the systems view of management, and many companies and managers we admire have done so.⁸

A good working definition of a system is that it has parts that are put together in some way (e.g., via organization and processes) to perform some function(s) to accomplish some more or less explicit purpose(s). It is probably pretty obvious to most of us that a system can be more than the sum of its parts, and this is the reason we create systems. For instance, a sales person, a development person, a manufacturing person, a support person, and a financial person, who individually only have the capabilities in their functional specialty can together create, sell, and deliver a product or service. It is just as obvious that a system can be less than the sum of its parts; this is why so many of us have such disdain for the organizations (systems) we are a part of. For instance, if we had ten machinists, each of whom could design and mill the parts of a machine and put them together into a working machine, we might hope that together they could make the machine ten times faster; however, together they might fail to agree on the design, trip over each other trying to get to the various tools and, in the end, take as long to build one machine as each of them would take individually (we have all seen situations like this).

The first difficulty in creating an effective and efficient system is that the parts may do more than do their own jobs (in which case we would hope their total effect would be additive)—they can affect each other in ways that may or may not be anticipated. Thus, it's hard to put the parts together in ways where we get more than the sum of the parts (or even to get close to the sum of the parts). In fact, the inter-part relationships may include a variety of time delays, including some that are very long, which make the inter-part effects doubly difficult to detect.

Thus, the job of someone designing or managing a system is to design and manage the interactions between the parts of the system. In particular, organizations need to plan how they deal with different rates of response in different parts of the system. However, this is easier said than done.

Of course, the first step in understanding what is happening in any situation is to look at the inputs and the outputs and to figure out the relationships between them, for instance, “If we do this, then that happens; or does it . . .” Some characteristics of a system are easy to observe or measure at the component level and from them calculate the overall characteristic of the system.⁹ For instance, we can add up employee vacation time to approximate the temporary replacement person hours we need to pay for. Other characteristics of a system are harder to observe or measure because they are a function of interactions among components that may not be present in any individual component.¹⁰ For instance, the developer may be able to create two new products a year, the support person may be able to release three new products per year while providing on-going support to 20 customers, the marketing person may be able to research the market and plan one new product per year, the sales person may be able to make 15 sales per year, the financial person may be able to arrange financing for two new product development efforts per year with ongoing support for 100 customers, and the manufacturing person may be able to produce 200 products per year. From that, we may be able to calculate how many new customers we can deliver to in a year but not be able to calculate how many highly satisfied new customers we will

generate in a year. Customer satisfaction may have to do with a gestalt of activities within the company (and even may involve a significant component of luck), which can't be calculated from the characteristics of the parts alone and is difficult to calculate even when one can observe the interactions among the parts.

There is a lot to think about when trying to design a system. Many people find it useful to think about the purposes of the system, the functions of the system, the architecture (or organization) of the system, and the processes of the system.

However, designing the purposes, functions, architecture (organization), and processes of a system is not enough. We also have to design a measurement system to determine if the system is doing what we want it to do and to determine what the parts of the system or their interactions are doing, so we can change or improve the parts of the system or their interactions. In fact, often times the struggle to understand how to measure a system, its various parts, and their interactions leads us to better understand the system's purpose and function. Since complex systems (such as a business) initially never work as planned (remember the follow-on to Murphy's law about Murphy being an optimist), measuring the system in appropriate ways is critical to the experimentation with the system to understand how it inherently works, its function, and to change it until we align our desires for the system with the way the system performs.

This difficulty of observing and measuring, resulting from the interaction of the components, works in two directions. The first is that you often can't calculate the characteristics of the whole from the characteristics of the parts. The second is that from the characteristics one desires for the whole one can't often easily figure out what the characteristics of the parts should be, or how they should interact.

So, we need systems, but systems are difficult to design, measure, understand, and manage because of the interactions among the parts. The job of the manager is to manage these interactions. However, it's hard to figure out what's going on overall by measuring the parts; and it's hard to figure out from measuring the whole what the parts should be doing and how they should be made to interact. Unfortunately, creating an effective and efficient system tends to require a lot of experimentation, albeit starting with the best ideas available.¹¹

2.3 FOCUS ON PEOPLE AND THEIR PURPOSES

The idea from the previous section of thinking about management as a system obviously isn't new. However, historically, managers have tried to treat their management systems as relatively simple entities. Looking back on management since the late nineteenth century, we¹² find it useful to retrospectively define and label three models for the practice of management which we think are quite representative.

Evolution of Management Practice

In presenting the three models, we do not intend to suggest that they are mutually exclusive. In the real world, things are not as distinct as the pure models suggest. In

fact, as the evolution from mechanical to biological to social model has occurred, the later models have often maintained some aspects of the prior models.

The mechanical model. The mechanical model draws an analogy between an organization and a machine. In the model, the workers in the organization are the parts of the machine. The business situation is analyzed, and procedures are developed to turn inputs into outputs. Each worker is assigned a particular—typically independent—procedure and taught to follow it rigorously. As long as the workers follow their procedures correctly and the inputs are as expected, the machine will keep turning out the expected outputs. The top manager's jobs, therefore, consist of designing the appropriate machine and controlling the workers and inputs to minimize variation. The mechanical model assumes a static environment for which one can build a machine that does the same things over and over. In this model, as with the parts of a machine, the people in the organization have no purpose other than to function in the way the owner or boss directs.

Organizations based on variations of this model were common around 1900 and are still frequently seen today. We are all familiar, from literature, movies, or from personal experience, with companies operated according to the mechanical model. We have all heard some version of the “I don’t pay you to think; I pay you to do what I tell you to do.” The story is told of Henry Ford—definitely a controlling manager—going on a trip to Europe. After he left, some of his employees thought it was an opportunity to make some design improvements that they couldn’t make while Ford was there. When Ford returned, the employees showed him their improved design. Ford jumped on the redesigned car, smashing it, saying, “Your job is not to make improvements; your job is to do what I tell you to do.”

Managers practicing this model simplified the management system they were trying to design and control by treating it like a machine with the people as additional parts who would do their tasks according to standard processes which they could follow essentially without thinking. We noted earlier in this chapter that the job of designing a management system is to design or select the parts and manage their interactions. By thinking of the management system as a machine, with specified inputs and specified actions by the people involved, the managers were able to understand more easily how the parts of the system related to each other and the characteristics of the parts necessary to produce the desired characteristics of the whole system. There was minimal interaction about the parts to manage (if in fact they could get the parts, especially the human parts, to behave as predictably as they were assuming).

However, as businesses grew larger and more complex and became more distributed, the mechanical model ceased to be adequate as the design model for the entire business (although it was still practiced in parts of the system in many cases). This led to practices which we call the biological model of management.

The biological model. The biological model draws parallels between an organization and a biological organism. In this model, the workers are the arms, legs, and sensory and other organs, ultimately serving the needs of the organism as a whole. Unlike the mechanical model, the biological model assumes that the parts of the

organism do their jobs according to their own program (including communication among themselves) much of the time rather than according to a program provided by the intellectual center. For instance, without conscious instructions from the head, the heart adapts on its own to calls from other parts of the body for blood to be pumped more or less rapidly. In the biological model, top management's job is to decide what the organism as a whole is supposed to accomplish, observe the functioning of the parts, and give feedback to the parts where the outputs aren't satisfactory. This monitoring of the outputs of the parts is necessary because the parts have the capability to operate to some extent without direct control of the top management.

Unlike the mechanical model, which assumed a static situation that could be handled by a machine, the biological model can be appropriate for situations where change needs to be dealt with, provided the change is either slow or predictable. If change is slow enough, an organism can gradually evolve to cope with it. If change is predictable (and if adapting is within the ultimate capabilities of the organism), top management can condition and train the parts to be able to handle the new situations. But, if the change exceeds the capabilities of the species to adjust, the species will become extinct, and its ecological niche will be taken by another species better adapted to the new environment; in some cases, this may be a species that evolved from the original species.

For much of the twentieth century, there has been an assumption that growth was the way to ensure survival of a company. Thus, an explicit purpose of the biological model has been business growth. In the mechanical model, the people in the organization had no purpose other than to function as parts of a machine as the owner or boss directed; in the biological model, the purpose of the people was assumed to be to support the growth of the organization as required by the top management, just as the hands or legs support the goals of the overall body as directed by the head.

Management methods consistent with the biological model (with some continuation of the mechanical model) have been what most companies in the U.S. used for much of the twentieth century—management methods such as traditional strategic planning, traditional cost accounting and control, functional organization structures, detailed job descriptions and standard procedures, a division of labor between those who do the work and those who improve the process, management by objectives, management by exception, and economic order quantities. Furthermore, typical measurements of performance such as return-on-sales and return-on-investment are output measures consistent with the biological model.

The biological model allows for clusters of parts of the system (functions, divisions, etc.) to have flexibility to address issues that come up which would not have been manageable unless designed into a mechanical model management system (which would be awfully complex if it anticipated and built in ways to handle every eventuality). Thus, in this case, a hierarchy of components exists with the managers at each higher level managing the interactions of the components below them. Presidents managed the interactions among functional VPs, functional VPs managed the interactions among their departments, and so on.

However, as businesses grew larger and more complex and also changed more rapidly, the biological model also proved to not be sufficient. The complexity of business and speed of change required the intelligent engaged participation of individuals throughout the organization, often working in dynamic arrangements across functional or divisional boundaries. And this individual interaction extends beyond the boundaries of the organization, to suppliers, customers, and other stakeholders. For instance, design teams can have people from every function in the organization along with suppliers, customers and even communities or special interest groups on them. Thus, management is required to manage (whatever that word means in this situation) a vastly increased (e.g., exponential growth) complex of interactions. The question is how to do this, and this brings us to what we call the social model of management.

The social model. The social model uses an analogy between an organization and a society of individual beings, where each individual has the ability to think and learn for himself or herself and have their own purposes. In this model, much interaction occurs among the individuals in the society, and the individuals depend on each other for their mutual adaptation and survival. This model is appropriate to situations in which change is unpredictable and to situations in which it is possible for the society to create its own future. In other words, the social model is the basis of a learning system: it is well suited to situations that require the continual development of new capabilities. The job of top management in the social model is to create a learning organization—to design a desirable future and to find ways to achieve it, particularly by managing the interactions among the individuals and organizational components in the society in a way that is compatible with (and builds on) the purposes of the individuals.

Because many mutually dependent individuals are in a social model organization, there can be many competing purposes within the organization; for example, the purposes of the employees, those of the company, and those of the larger society that contains the company. Sometimes these multiple purposes are in conflict with each other. Thus, the social model recognizes a multiplicity of purposes to be dealt with; however, the social model also assumes the possibility of a level of collective action that can offset problems caused by multiplicity of purposes.

Leadership versus Empowerment

When trying to develop a system for managing interactions, especially when many of the interactions are about interactions of people, it helps to have a theory of how humans behave. Implicitly, managers using the mechanical, biological, and social models have theories of human nature. The theory of human nature consistent with the mechanical model is that people need to be controlled.¹³ The theory of human nature consistent with the biological model is that people are motivated to work if certain conditions are satisfied.¹⁴ As we consider our experience, observation of organizations, and what has been learned about human nature in the era since MacGregor, it seems pretty clear that both theories are right, in some sense. Most people want to be

led, and they want clear goals and security.¹⁵ On the other hand, many people want to contribute, and some of them are interested in finding new ways to make these contributions; however, such contributions and innovation take initiative (going beyond what one has been told to do), and this is uncomfortable or insecure. Also, though people want to be led, they are also often suspicious of those who lead them. All in all, people in organizations often are in a state of at least partial ambivalence between wanting to be led and to make personal contributions and being paranoid about being led and being asked to make personal contributions.

A naive interpretation (we believe) of the evolution from the mechanical model, through the biological model, toward the social model is that as the employees (and other stakeholders) have become more empowered, management is required to become more laissez faire. Thus, many people think that the biological model is at the top left (point A) of Figure 2-4 and that the social model is at the bottom right (point C) of the figure,¹⁶ and the biological model is somewhere in between (point B).

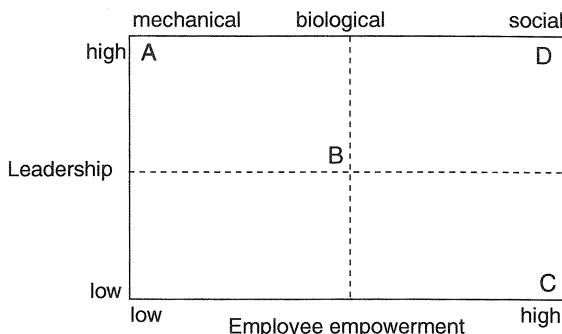


Figure 2-4. Leadership versus Empowerment

However, as we have already stated, people in general want to be led even though others are interested in innovating themselves. Also, for a large, complex organization (anything bigger than quite small and more complex than quite simple), laissez faire management doesn't provide sufficient leadership or management of all of the necessary interactions: we are likely to get something that is much less than the sum of its parts because people are not pulling together and others are not engaged or pulling at all.

Thus, to obtain a system's benefits in the face of the need for the social model, management has to learn how to design systems that function at the top right (point D) of Figure 2-4—very strong leadership that provides alignment of empowered people (people with the skill, engagement, and authority to do what needs to be done) throughout the organization. Encouragement and alignment of participation is needed without exactly explicit enforcement of participation.¹⁷

Of course, developing a shared vision is important, and we will provide illustrations later in the book about how this was done. But that's not enough. As we noted

in the last section, here again note that it's hard to figure out how to provide strong leadership, coordination, and alignment while simultaneously obtaining the engaged intelligent participation of the individuals. At this point, we know of no simple, widely applicable method of doing this (although various people have claimed such a method). Once again, creating an effective and efficient system tends to require much experimentation, albeit starting with the best ideas available.

2.4 INTEGRATE BEST PRACTICES

We don't see the methods that we describe in this book as being in competition with other methods. Rather, we see one of the jobs of the senior managers as integrating so-called "best practices" from all relevant sources into the organization's overall system.

The top management should select and integrate the components *apparently* relevant to the organization's culture and business. This will provide a system with which experience can be gained and lessons learned and which can be reflected upon and adjusted for increased relevance and efficiency. Without an explicit system or process, efficient improvement is unlikely (improving the intangible is very difficult, if not impossible); or, if one treats management as a collection of isolated tasks, improvements to one task may have detrimental unintended consequences for the other tasks.

The overall system might include components from lean production, systems thinking, interactive management, business process reengineering, system dynamics, total quality management, and others. There is no single right system. Companies need to integrate best practices from any relevant sources to create a system that, once created, provides a source of best practices for others to emulate or improve upon.¹⁸

Many people have a tendency to treat various management methods as separate and even in competition with each other. Business schools are typically organized into relatively isolated departments that specialize in particular management functions. Even disciplines such as system dynamics or systems thinking (which should take an integrated view), tend to see their discipline as the single true solution to all problems. Business consultants seek to differentiate their methods from other methods rather than to integrate them. Business managers often see the approach that has brought them success as a replacement for the methods of their predecessor in the organization. Business journalists delight in explaining which methods show startling promise and which previously promising methods are now discounted.

Of course, the real world does not work this way. A top manager cannot pay attention only to marketing or accounting, only to operations or strategy, or only to internal activities versus external activities. A top manager must be concerned with all phases of operation of the business. Similarly, a top manager cannot only be concerned with methods of human motivation, only with methods of process improvement, or only with organizational structure. A top manager must be concerned with having the appropriate amount of each of these in his or her organization.

From our perspective, one of the greatest losses of opportunity in business (not to mention causing the most possible damage) results from the tendency of managers,

academics, consultants and everyday culture to see a system in terms of competing parts and methods rather than as a potentially integrated whole. One of the two most important contribution we hope this book makes is to get people talking about integrating management methods and perhaps to begin to cast doubt on the integrity of academics, consultants, the media, and managers who continue to promote destructive behavior of playing the methods against each other. The other most important point is to look at integrating the methods in to a system, which we discussed in an earlier section.

The integrative approach described in this section is the right one for at least the following reasons:

- The world is complex and it needs a variety of methods to deal with its different aspects.
- One is better off if one can build on what has gone before. This is the natural course of development in all fields of endeavor where one can tell if one is achieving increased predictability. The tendency in management to have various “schools” positioned against each other is more like the social sciences where various “schools” (or competing disciplines) are arguing who has the greater truth—this happens less frequently in the natural sciences, the performing arts, competitive sports, etc., where one form or another of the scientific method (e.g., what developmental psychologists might call “reflective practice”) is used to determine what makes a predictable difference and the helpful methods kept and the unhelpful methods discarded.
- A method that works across disciplines may be more likely to be “true” (represent reality) than one which only appears to work in one discipline. We need to seek parallels between methods to be able to detect differences (which might help us in different ways) and to see what appears to be a more “universal truth.”
- New innovations frequently result from cross-disciplinary interactions.

Throughout this book we will provide examples of companies that integrate best practices from a variety of sources.

In summary, each company must build and continue to improve its own system to address its situation, culture, and people’s needs. A major purpose of this book is to summarize or generalize the methods that various companies and managers have successfully used to move their companies toward increased capacity to address today’s business complexity and speed of change, so others may build on these experiences.

2.5 FINANCIAL BENEFIT

We cannot leave this introductory chapter without at least mentioning the issue of whether the results from business improvement are worth the effort, or the benefits worth the costs. In this book we will not address this issue thoroughly—we don’t want to get involved in statistical debates. At this point, we only will make several summary points and sketch the results of some studies.

First, the tendency for companies that improve customer satisfaction (through better product and service quality) to do better financially has been extensively demonstrated.¹⁹ We suspect that most people also intuitively believe this.

Second, studies of winners of and serious contenders for the U.S. Baldrige and other quality awards appear to indicate they do measurably better on various financial metrics than companies that haven't had this Baldrige success [134, 267, 280, 291].

Third, the majority of managers and workers we know assume that they must continue to improve how their companies operate if they are to remain competitive.²⁰

Fourth, the top managers of many companies that we judge to have done excellent management improvement work give anecdotal evidence of the importance of their improvement efforts compared with where they might have been without the improvement efforts.

Another way of looking at the issue. It is always difficult to do an explicit quantitative benefit/cost tradeoff that shows the relative value of doing improvement work. The costs are often all too easy to capture, even though the benefits are hard to quantify and to correlate explicitly with the improvement work. However, there is another way of looking at this trade off—an informal way, but a way that may be more intuitively compelling. Rather than thinking of the benefit from an improvement versus the cost of the improvement, think about the cost of *not doing* the improvement versus the cost of doing it.

For instance, to do the “voice of the customer” project in order to understand the features needed in a new product line may cost a few person-months of labor, travel expenses, and so forth. Not to do the voice of the customer project will save tens of thousands or perhaps a hundred thousand dollars but may well leave a situation where insufficient motivation exists to undertake a needed new development with little knowledge of what the new development should provide customers. Without the project, the current product may grow old and lose market share with no new product to capture market share. Ultimately, a product generation may be missed with major financial consequences and perhaps failure of the business. The cost of doing the improvement may be insignificant compared with the cost of not doing it.

NOTES

1. We argue in this chapter that companies need systematically to develop skill to survive and flourish in the rapidly changing world. Therefore, we advocate treating management as a system or learning process and integrating into that management system relevant methods regardless of the source. How to do this is the subject of the rest of the book. In particular, we provide numerous case studies showing how various businesses and other institutions have proceeded in developing their unique organizational capability.
2. This four-stage model of skill development is frequently cited in the training establishment. The junior author believes he first heard it from Larry Raskin of

- Analog Devices. We are not sure what the proper citation for this model is. A book that describes the model is [253, pages 11–12].
3. This model is described in detail in [86, Chapter 1, “Five Steps from Novice to Expert,” pages 16–51].
 4. In later chapters, we will demonstrate the benefit of beginning to learn a new skill by learning a step-by-step process (that is, a minimal sequence of rules of thumb), which gives one a way to practice performing in the new area and, through practice and reflection on the practice over time, to develop one’s way to mastery.
 5. We have derived this model of learning from [78].
 6. Fernando Flores in [273] notes that any important idea typically receives one of two reactions. The first reaction often is “I already know it”; if perchance the people hearing the new idea are willing to admit they do not already know it, their other typical reaction is “It’s trivial.”
 7. In 1992, we visited Japan with a group of CQM CEOs, quality officers, and development VPs. During this visit we heard a slogan encouraging learning from others. We were visiting the Software Quality Department of NEC, and they showed us a video that used the analogy of climbing Mt. Fuji, which is an important pilgrimage for many Japanese. Apparently there are two approaches to climbing Mt. Fuji. One is to attempt to walk all the way from the bottom. Another is to take a bus a substantial way up the mountain, to what is known as the Fifth Station, and to walk to the top from there. The former approach has the disadvantage that one may run out of energy before getting to the top of the mountain. The latter approach has the advantage that one conserves energy to make sure one has the energy to make the final push to the top of the mountain. The analogy the NEC software people were making is that in software development one should copy everything one possibly can from what has already been done by others—“take the bus to the Fifth Station”—so that an organization and its people have enough energy left to make the unique contribution that only they can make.
 8. We see an important component of being a manager or leader as treating management or leadership not as just a collection of tasks but rather as a system or process that can be improved. Others support us in this view. For instance, Dr. Fred Schwettmann, a former senior manager at HP and former CEO of Read-Rite, in a 1998 presentation to a CEO Roundtable of the CQM West chapter, cautioned against treating leadership as just a collection of tasks and listed a nine-step “process of leadership” that included the following steps: choosing the top management team, statement of purpose, choosing the mission, declaration of values, five-year strategic plan, one-year tactical plan, implementation, review, and rewards and recognition.
 9. Russell Ackoff calls these Type 1 properties.
 10. Russell Ackoff calls these Type 2 properties.

11. For more detail in the topics of this section and the next, see [186, Appendix A] and [2, 114]
12. Taking a lesson from Ackoff.
13. The famous Theory X.
14. MacGregor's famous Theory Y.
15. Rapialle in a private session on leadership at the Center for Quality of Management, Cambridge, Mass., January 28, 1997, described how people (at least in the U.S.) want a leader to be someone who leads them. We also see this in everyday business life where people seem to want to create legends about the skills of appointed (and respected) leaders.
16. Bob Putnam of Action Design first showed us a figure of leadership versus empowerment, from which we derived our own version of the figure which we use here.
17. In some sense, this figure is representative of the overall purpose of modern management. It is not sufficient just to forcefully espouse a direction, and it is not sufficient just to have prepared people. A manager must develop people who can do what needs to be done and get them aligned to do it. All five traditional management functions (control, leadership, organization, planning, and staffing) are implicit in being at the top right of the figure.
18. For an expanded discussion of this topic, see [187].
19. The profit impact of market strategies (PIMS) study is one well-known example; see [251, 79].
20. The debate is only about how to undertake these improvements.

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3

Developing a Unique Organizational Capability

Broadly speaking, in the first two chapters of this introductory part of the book, we have told the following story:

- The practice of business has evolved over the past century, and it continues to evolve at an increasing pace.
- The evolution of business practice has been driven substantially by an evolution in the definition of quality or customer satisfaction and that, in turn, has driven an evolution of the methods used to assure quality and customer satisfaction. Customers have a greater variety of expectations and more options for satisfying their expectations than ever before.
- The evolution of business practice, to compete successfully in satisfying customers, has resulted in several important changes in management thinking. Businesses need systematic ways of developing skill. Management must be treated as a coherent system. Management must deal with people and their purposes and spend time creating “empowered” employees and aligning them. Ideological biases need to be swept aside and best practices from any relevant sources can be used as part of the management system.

We will now finish this story and introduce the rest of the book.

3.1 FOUR PRACTICAL REVOLUTIONS IN MANAGEMENT

The first edition of our book was nominally about the why and the how of total quality management or TQM. TQM had developed over nearly 40 years, first in the U.S., then in Japan, and then again in the U.S. Historically, TQM was focused on improving the quality of products and service and doing so with maximum efficiency.¹ Therefore, in our first edition we defined total quality management as an evolving system, *developed through success in industry*, for continuously improving products and services to increase customer satisfaction in a rapidly changing world.

TQM concepts and practices have been developed over many years by companies seeking practical methods to improve the quality of their products and services. TQM has never been an abstract philosophy, nor has there been a single correct way to implement TQM; it must be customized to each company's culture and history.

Although each company has had to find its own way to implement TQM, four areas of concepts and practices are common to most successful implementations, and these differ from practices in many non-TQM companies. They represent four revolutions in management thinking (see Figure 3-1).

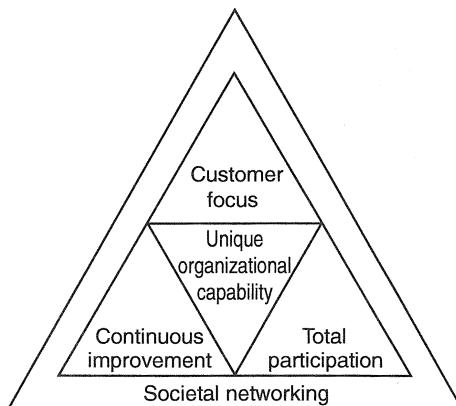


Figure 3-1. Four Revolutions of Management Thinking

1. Companies must *focus on customers* and on satisfying their needs. Therefore, they must be able to react fast to changing customer needs and to focus their limited resources on activities that satisfy customers. (This is in contrast to the common attitude that the “company knows best” what customers need.)
2. Companies must *seek continuous improvement* of the processes that lead to higher quality products and services. Continuous improvement involves using a scientific approach to make improvements (analyze facts, base actions on facts, test results empirically), doing step-by-step improvements to get to market quickly and acquire real experience, and doing iterative improvement to reach ever-higher levels of quality. (This is in contrast to the common attitude of “if it ain’t broke, don’t fix it.”)
3. Companies must *seek total participation* of their employees. All capabilities of all company members must be used if companies are to make continuous improvement and to seek customer satisfaction. (This is in contrast to the common attitude that “some people think and some people do.”)
4. Companies must *participate in societal networking* (that is, mutual learning with other companies) to avoid reinvention of methods, to implement quality practices more quickly, and to create a quality culture in which to do business. (This is in contrast to the common attitude of “only look out for ‘number 1’.”)

3.2 EVOLUTION OF OUR UNDERSTANDING

By the time we drafted the first edition of this book the focus of the methods known as TQM was beginning to move from the *management of quality to the quality of management*—the focus of the methods was moving to deal with the ongoing improvement of the way an organization is managed in a rapidly changing world. Thus our first edition was to some extent about improving the overall management of an organization and not limited to product and service quality.²

Nearly another decade has passed since we began to write the first edition, and the evolution of the problems organizations face has continued. For instance:

- Organizations must continue to improve and adapt within their existing businesses and general manner of operating—they must get better. They must also learn how to improve more quickly and efficiently—get better at getting better.
- Also, beyond continuing to improve the way they operate their business, many organizations find it necessary to redefine their business upon occasion. To these ends, they need to create an appropriate management system or organization for their current situation. In fact, we have come to see during the time since the first edition that the methods we were teaching were aimed at helping a company create its appropriate unique organization.
- Finally, over the past decade or two, organizations of every type have come to think of themselves more like businesses. Once upon a time only for-profit manufacturing and service companies were thought of as being in business. These days, at least in the U.S., there is increasing pressure for government, the military, health care organizations, schools and colleges, charities, and even churches to operate in a more business like fashion.³ There is loud complaint when the government of a state or a health care organization “does not operate like a business” or “is not accountable.”

The methods that fall in the categories we call the four revolutions in management thinking continue to apply to these expanding pressures on organizations; however, our understanding of the relationships among the four categories has changed, as has our understanding of the relative importance of the methods within the categories.

At the end of the day, the goal of each organization is to become the unique organization it wants and needs to be, however small or great a change this requires from the existing organization. Thus, each organization needs to transform itself and requires a process by which to accomplish the transformation (see Figure 3-2).

Obviously, there are two issues when one considers transforming an organization from its current state to a new state: what to do and how to do it (see Figure 3-3). In fact, there are two key problems that any business must deal with:

- Figuring out what the market wants and the intersection of that with what the company can provide
- Aligning and mobilizing itself to deliver what is needed

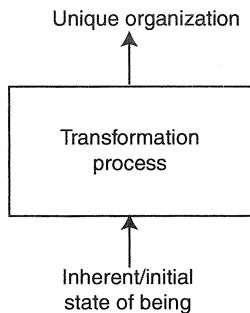


Figure 3-2. An Organization Needs a Transformation Process

What to do → How to do it
(customer/market) (company process)

Figure 3-3. Each Organization Has Two Fundamental Issues

The market provides input about what needs to be done. The methods of customer focus, one of our management revolutions, provide the means to hear and understand what the market is saying or will soon say. The how is what we have to do in our own organization, that is, to improve our processes (see Figure 3-4).

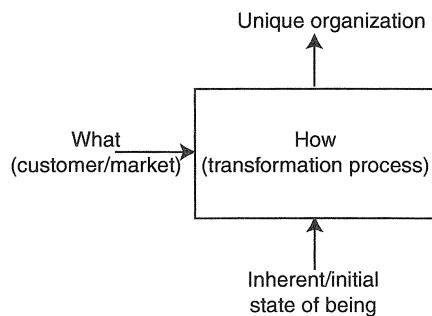


Figure 3-4. The What and How Drive the Transformation

Figuring out what the market needs is hard enough; unfortunately, getting an organization aligned and mobilized to provide what the market actually needs is often more difficult. Explicit methods are needed for alignment and mobilization. In particular, we need methods to undertake improvement efficiently and effectively—methods of continuous improvement, another of our management revolutions.

Organizations will be improving processes which involve material, information, or people. In any case, people (individuals, teams, the whole organization including

perhaps outside allies) must be involved in changing the process. Thus, methods are also needed to assure participation of the appropriate individuals, teams, and parts of the organization in the improvement activities—methods of total participation, yet another of our management revolutions.

These two key components of how an organization transforms itself are shown in Figure 3-5.

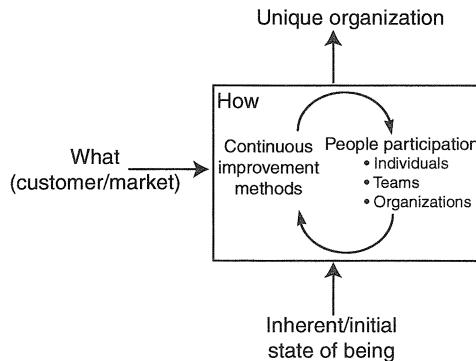


Figure 3-5. The components of the Transformation Process

Finally, all organizations live in a societal environment that affects and can support them in various ways. Thus, organizations need methods to understand and learn from their societal environment—methods of societal networking, our last management revolution. This is shown in Figure 3-6. The figure also illustrates that the unique organization that results from a transformation effort is the initial state for the next cycle of transformation.

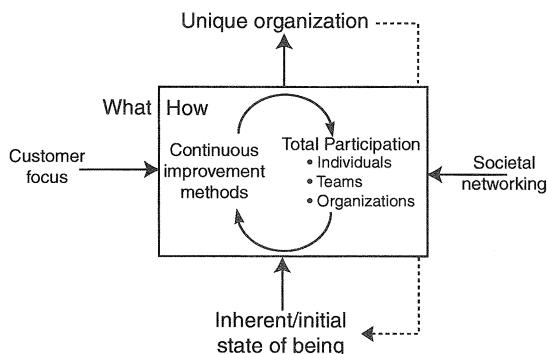


Figure 3-6. The Four Revolutions Transform an Organization

As can be seen in Figure 3-6, the methods of two of our four management revolutions take place primarily within an organization, and the methods of two of our four management revolutions provide the way that the organization collects information from the external world. While the methods in all four areas are needed, we see the methods of continuous improvement and total participation that deal with how the organization effects its transformation as more important; most of this book is about these two areas. The methods of customer focus and total participation provide the context for the methods of the other two revolutions. Thus, two chapters on customer focus begin the book and two chapters on societal networking end the book, bracketing the over 20 chapters on the other two revolutions that make up the bulk of the book.

In summary, the four management revolutions are the areas of practice for a company striving for business improvement and organizational learning. The goal of these methods is to create the appropriate unique organization (see Figure 3-7).

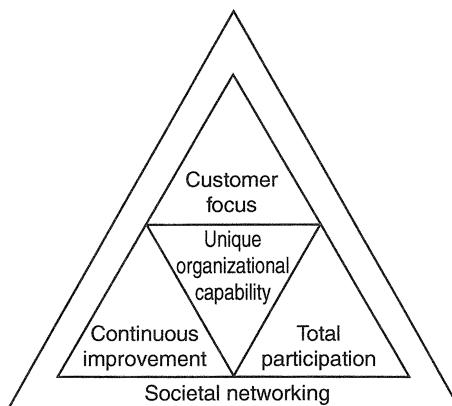


Figure 3-7. Four Revolutions for Creating Unique Organizational Capability

We describe these new needs and the improved methods in the rest of this book. In particular, the methods described address the following needs of organizations:

- To have a dynamic (not static) implementation strategy. The quality assurance mindset of TQM deals primarily with material and information processes that have static relationships between the inputs and outputs of the subcomponents of the processes. Our broader viewpoint emphasizes iterative cycles of development, phase-in, and maturity.
- To continue to investigate, explore, and study. The traditional TQM approach limits itself to interlocking cycles of routine operation⁴ and improvement of the operation.⁵ The goal is to plan for execution. Our broader approach recognizes that sometimes we don't know what to do next, and our goal must be to investigate, explore, and discover until we figure out what to do next—to plan for study.⁶

- To use diffusion in reinforcement itself. The typical TQM implementation focuses on mobilizing teams. Our broader approach is to diffuse the methods not just within teams but in a reinforcing way among individuals, teams, organizations, and across society.⁷

Addressing this combination of needs we believe is a unique aspect of our book.

3.3 FOUR LEVELS OF PRACTICE

Implicit in the four revolutions of management thinking is the need to practice business improvement and organizational learning at four levels: individual, work group, organization, and regional, industry and often global levels (see Figure 3-8).

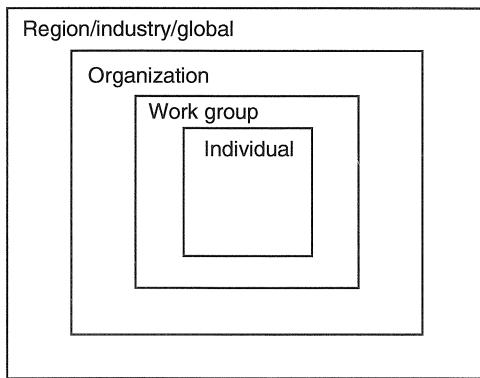


Figure 3-8. Four Levels of Practice

The purpose of the methods of the four revolutions in management is to appropriately transform the organization's capability. Ultimately, all transformation begins with individual action. Thus, the individual level of practice is necessary to shift the purpose of each employee's work from just doing the work assigned to satisfying the customer and to give the individual employee the tools necessary to accomplish this task. This practice level brings the idea of customer/supplier relationships to everyone in the company. If employees are to meet and satisfy the customer or next process, their skills must shift from just doing routine work to doing both routine work and improvement work. Effectively making such shifts requires a system.

However, individuals learn better and are better able to accomplish their desired improvements in the context of a supportive work group or team. At the work group level, you also want to unite routine work and improvement work (which requires a focus on process). You do this by encouraging mutual learning and teamwork, by providing a system that makes routine work and improvement clearly part of the job, and by taking the time for improvement.

In turn, work groups and teams learn more efficiently and are better able to accomplish their desired improvements in the context of a supportive organization. At

the organizational level, you want to integrate innovative improvements with the corporate goals and mobilize the entire company in a systematic pursuit of the corporate goals.

Finally, organizations learn more efficiently and are better able to accomplish their desired improvements when they explicitly find those aspects of the external environment that motivate and support them. The industrywide, regional, or national level of business improvement practice should be directed toward a broader improvement culture that supports an individual company's business improvement or organizational learning efforts. This support can be through informal "networking," collaboration for mutual gain, and transfer of successful practices among companies and others interested in quality. The Center for Quality of Management (CQM) was established to provide such sharing of experiences and resources. This networking also motivates us to keep going when we are flagging. In Japan, successful practices are integrated into training materials from the Japanese Union of Scientists and Engineers and the Japanese Standards Association, which many companies use; the journals and seminars of national quality societies also serve this purpose. National quality awards, such as the Baldrige Award in the United States, encourage nationwide awareness of quality; Japan's Deming Prize is part of an extensive system of national quality awareness.

Chapters 4 through 29 describe the systems and methods you can put in place to implement the four practical revolutions in management and the four levels of practice.

NOTES

1. Thus, many people think of TQM as being focused on quality assurance, or the *management of quality*. Neither the first edition of this book nor this second edition puts much emphasis on this historic focus of TQM on quality assurance. There are many other books on quality assurance and this narrow focus of TQM.
2. In fact, shortly after the first edition was published in 1993, we began speaking and writing about TQM as total quality *of* management rather than total quality management. During the last several years, when trying to be precise, we have spoken of TQ_{of}M rather than TQM.
3. See [186] for a number of case studies of the application of business improvement methods in non-traditional "industries."
4. The SDCA cycle.
5. The PDCA cycle.
6. This might be called the PSDA—plan, study, develop, act—cycle.
7. We will elaborate on this point in the following section.

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