TQM's Challenge to Management Theory and Practice

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TOTAL QUALITY MANAGEMENT (TQM) IS MORE THAN A FAD OR A BUZZWORD, ARGUE THE AUTHORS. IT IS EVEN MORE THAN A TECHNIQUE FOR CONTROLLING AND motivating employees. TQM is a challenge to conventional management techniques and to the theories that underlie them. Therefore it cannot simply be grafted onto existing management structures and systems. If its benefits are to be fully realized, then companies need to prepare themselves for organizationwide change — including top management's relinquishing of power. Furthermore, TQM practices cannot be combined with strategic initiatives, such as corporate restructuring, that are based on conventional management theories. The failure of one or both programs is inevitable.

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The success stories of total quality management (TQM) are well known. They include such companies as Xerox, Allen-Bradley, Motorola, Marriott, Harley-Davidson, Ford, and Hewlett-Packard. These companies committed themselves wholeheartedly to TQM; they made fundamental changes in their management practices and philosophies and improved product quality and company performance.

But more often, companies that have tried to implement TQM have not achieved such dramatic benefits. They may have produced some tangible improvements in product and service quality, but the quality improvement programs ultimately fell apart. In many of these companies, the TQM programs lost momentum because disagreements over goals and implementation procedures surfaced, upper-level managers turned their attention to other priorities, and employees became increasingly skeptical about organizational commitment to the programs. In other companies, quality programs clashed resoundingly with other strategic initiatives.

Consider the case of Kodak. In 1983 and 1984, Kodak embarked on a companywide quality campaign in response to increased competition, high silver prices, and an overvalued dollar. The company's "corporate policy quality statement" committed Kodak "to be world leader in the quality of its products and services. We will judge this quality by how well we anticipate and satisfy customer needs."[1] During the next few years, Kodak trained employees in statistical techniques, held annual worldwide quality conferences, involved top management in quality programs, disseminated reports of quality improvement experiences throughout the company, and required managers to formulate personal quality improvement projects.

Yet despite considerable improvements in operational and competitive performance, Kodak's disappointing financial performance led to increased pressure for more drastic corporate restructuring. During the 1990s, top management became increasingly confused by the dilemma of managing continuous, incremental improvement while making radical, top-down change. A $1.6 billion restructuring in 1991 incurred massive early-retirement costs but did little to yield longer-term savings in operating costs. In January 1993, Kodak appointed Christopher Steffen from Honeywell as chief financial officer in order to enhance shareholder value through more aggressive financial controls. Conflict between Steffen and Kodak's CEO, Kay Whitmore, led to Steffen's departure after eleven weeks, only to be followed by Whitmore's departure in August. Underlying the top management discord at Kodak is the conflict between two unreconcilable approaches to change management.

The recent histories of Alcoa and McDonnell Douglas point to similar conflicts. At Alcoa, incoming CEO Paul O'Neill viewed Alcoa's TQM program as a barrier to more radical change, while, at Douglas, the massive downsizing in 1991 and 1992 emasculated a once-ambitious TQM effort. These experiences support our basic message: TQM inevitably conflicts with established Western management practices. Its assumptions and theories are quite different from those underlying conventional practices, and therefore TQM will not succeed in a firm unless conventional practices are transformed. The tendency for TQM to create dissension within firms arises not only because TQM conflicts with conventional management ideas, but also because TQM conflicts even more violently with other contemporary trends in management thinking. If TQM is one new management paradigm forcing a rethinking of management concepts and practices, the other is what we call the "economic model of the firm," which is based on the principles of maximizing shareholder value. We argue that TQM and the economic model are inherently incompatible, and that companies will need to choose, implicitly if not explicitly, between the two. To that end, we explore the differences between TQM and conventional management practices, particularly those influenced by the economic model of the firm.

Table 1 Development and Diffusion of TQM and Other Management Methods

	TQM	Other Management Methods
Intellectual Origins	Statistical theory: sampling and variance analysis.	The social sciences: microeconomics, psychology, and sociology in particular.
Sources of Innovation	Industrial engineers and physicists working in industry and government.	Leading business schools and management consulting companies.
National Origins	International: developed in the United States, transferred to Japan, subsequently diffused and extended within North America and Europe.	United States, then transferred internationally.
Dissemination Process	Populist: smaller companies and middle managers have played a prominent role.	Hierarchical: from leading industrial corporations to smaller, less prominent companies; and within companies from top management down.

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What's Different about TQM?

TQM comprises a group of ideas and techniques for enhancing competitive performance by improving the quality of products and processes. Although TQM has been disseminated throughout Japan, North America, and Europe, we are particularly interested in its profound impact on U.S. businesses since the early 1980s. The techniques and philosophy of quality management can be traced to W.A. Shewhart's *Economic Control of Quality of Manufactured Products,* published in 1932, but rapid dissemination of quality management in the United States did not become a phenomenon until the 1980s. W. Edwards Deming's appearance on a CBS documentary broadcast on 24 June 1980 was a turning point; "If Japan Can . . . Why Can't We?" triggered a surge of interest in the quality management methods that had originated in the United States but that Japanese companies had applied and developed in the preceding twenty-five years.[2]

TQM's origins and pattern of diffusion are quite different from those of other management and organizational innovations that have swept through the business world during the postwar period, innovations such as management by objectives, time-based management, and the strategic management of core competences. Four distinctive features of TQM stand out (see Table 1).

• **Intellectual Origins.** Most contributions to modern management theory and technique originated in the social sciences. Microeconomics is the basis for most financial management techniques (e.g., discounted cash flow analysis, security valuation, and accounting principles); psychology has guided the development of mar-

keting techniques and decision support systems; and sociology provides the conceptual basis for much of organization design. The theoretical basis of TQM, however, is statistics. At the core of TQM is statistical process control (SPC), which is based on sampling and variance analysis.

• **Sources of Innovation.** The R&D centers for most modern management ideas and techniques have been the leading business schools and management consulting companies. In contrast, the pioneers of TQM — Deming, Shewart, Joseph Juran, and A.V. Feigenbaum — worked primarily within industry and government rather than in universities. Their backgrounds were mainly industrial engineering and physics, and they had few links either to business schools or to consulting companies. Consequently, business schools have not been in the vanguard of the quality movement, and business school faculty have been students of TQM rather than the teachers. In fact, Motorola and Milliken opened their quality training programs to university professors in 1991.

• **National Origins.** TQM's development pattern is also atypical. Most concepts and techniques in financial management, marketing, strategic management, and organizational design have emerged in the United States and subsequently diffused internationally. TQM, by contrast, represents one of the first truly global management techniques. It began in the United States, was developed mostly in Japan, and, during the 1980s, developed further as it diffused throughout North America and Europe. TQM thus integrates American technical and analytic skills, Japanese implementation and organizational expertise, and European and Asian traditions of craftsmanship and integrity.

The quality movement has been a populist one. Smaller companies were the original leaders in TQM.

• **Dissemination Process.** The dissemination of most modern management innovations has been hierarchical. Typically, the pioneers are leading industrial corporations such as General Electric, IBM, and General Motors. Within companies, dissemination has been a top-down process from chief executive officers to divisional heads and down through the managerial ranks. The quality movement, by contrast, has been a populist one. Smaller companies were the original leaders in TQM. Nashua Corporation was the first U.S. company to employ Deming as a consultant. Other pioneers were Milliken, Florida Power and Light, Allen-Bradley, First National Bank of Chicago, and Marriott. The Growth Opportunity Alliance of Lawrence, Massachusetts, a consortium of more than fifty mostly small companies, was an early convert. Malcolm Baldrige National Quality Award winners have included Globe Metallurgical and Wallace Company.

In addition, the CEO has not always been the prime driver for implementing TQM within companies. Departmental and divisional managers have often been the initiators. At Ford, William Scollard, general manager of the auto assembly division, brought Deming to the attention of Ford president, Donald Petersen.[3]

Implications of TQM for Management Practice

To understand the broad implications of TQM, it's useful to consider how statistical process control, a technical tool of control, evolved into TQM, a philosophy that affects all functions of the firm, at all levels of management.

SPC's Impact

There is nothing revolutionary about SPC. It applies sampling theory to production processes in order to detect malfunctions faster than is possible with final inspection. SPC is consistent with Taylorist principles of scientific management; in fact, it represents a significant advance in scientific management.

But whereas SPC in its basic form simply determines when output is falling outside the boundaries of "acceptable quality," Feigenbaum, Deming, and Juran developed SPC into a tool for systematically analyzing variations and defects and, ultimately, for redesigning production processes to reduce variability. This has had important implications for the way work is done.

First, it implies that the individual operator rather than a quality control engineer is best placed both to identify unacceptable variation and to take remedial action. This leads to changes in operations management that reverse trends of the past half-century such as deskilling, specialization, and increased supervision. SPC requires operator training and gives the operator more responsibility for performance, innovation, capital equipment, and the work environment.

Second, SPC's emphasis on identifying and correcting the sources of variation directs attention to the linkage between production activities. Implementation of

SPC requires detailed analysis of the production process, typically using process flow analysis charts. As a result, the manufacturing process is perceived as a single integrated system, and operators and line managers have to communicate and share knowledge in order to diagnose and correct problems. This emphasis leads naturally to the view of a production chain as a series of supplier-customer relationships.

From SPC to TQM

Whereas SPC is a precise set of quality improvement techniques, TQM extends quality improvement methods to all functions and all management levels; TQM is a companywide philosophy of quality improvement. This philosophy contends that the firm's primary goal is to better meet customer requirements by improving the quality of products and processes. The implications for management are fundamental and far reaching.

• **The Role of Management.** In addition to the decentralization of operational decisions, TQM typically increases participation in higher-level decisions among those in the lower echelons. These two trends — self-management and participative decision making — constitute a substantial change in managers' roles. Traditionally, managers, by virtue of their training and experience, were responsible for gathering information, making decisions, and applying the incentives and sanctions needed to implement those decisions. Under TQM, managers' priorities are reordered: their decision-making and control functions contract, and their roles as consultants and coaches grow. Thus, jobs become less specialized not only horizontally, but also vertically. The distinction between "those who think" and "those who do" is blurred.

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Diffusion of decision making is matched by diffusion of coordination. Under TQM, shop-floor teams become involved in communication and coordination with teams in other departments and units. Flows of information and communication become less vertical, more lateral.

These changes can have profound effects on organizational structure. Within the formal structure, they tend to widen managers' span of control, which permits the removal of whole layers of middle management and corporate staff. A flatter organizational structure results.[4] In addition, an informal parallel structure may emerge.[5] At Texaco, for example, a "corporate quality steering committee" and a "total quality task force," supported by a "quality resource center," lead a number of quality groups that have been established throughout the company.[6]

• **The Effects of Integration.** Some of the most significant effects TQM has on an organization arise from its effectiveness in promoting coordination and integration of productive activity. Juran's contributions to TQM are particularly important in this regard.

To Juran, quality management is not simply the task of identifying and eliminating variation. It is serving customer needs. This has a number of implications. First, TQM focuses the entire company on customers; it gives the company one externally focused goal that all departments and functions can support. Many companies, such as Baldrige Award winner Globe Metallurgical, have emphasized increased employee interaction with customers.[7] By 1990, 24 percent of *Fortune* "1,000" corporations had one-half or more of their employees involved directly with customers.[8]

Second, this customer focus provides not only an objective for the company but also a mechanism that unifies processes. Serving the external customer may be viewed as the final link in a chain of supplier-customer relationships that extends throughout the company from R&D and purchasing to sales, distribution, and customer support. Under such a system, the requirements of the final customer drive a demand-pull sequence of relationships, where the goal of each stage is to satisfy the requirements of the subsequent stage.

Third, quality management is more than a unifying objective and mechanism, it is a philosophy. It is the company's *raison d'être,* and it integrates the entire management of the company.[9] Juran's approach links quality improvement and control with quality planning, thus extending quality management from the realm of operations into that of strategic planning. As a result, quality management is not the preserve of the quality assurance department or even operations management; it is the primary responsibility of top management.

These organizational changes, deriving from the focus on customers, have had wide-ranging effects. For instance, the principles of identifying and measuring quality variables, establishing targets, introducing accountability, and promoting innovation and continuous improvement have been applied to work that has previ-

Accounting and TQM

Of all the organizational functions, accounting has probably seen the most intense conflict between TQM and established management practice. Critics charge that, with the traditional accounting system, management does not focus on the "real" costs of poor quality because these costs are hidden in many different operating expense items. Accounting may capture internal rejects and customer returns, but it does not capture downtime that occurs because of poor quality parts and materials. It is also argued that the failure of conventional management accounting systems to include many of the benefits of improved quality results in underinvestment in capital equipment, new technologies, and training.

Accounting data focuses on reducing the cost of materials and direct labor. Typically these items are the least affected by TQM. Conversely, critical performance improvements made by TQM go undetected, including indirect cost savings arising from lower inspection and maintenance, reduced lead time to market, improved customer satisfaction and reputation, flexibility in making product changes, and future reductions in warranty costs. In the absence of broader-based accounting measures, companies have frequently failed to perceive the true benefits of quality circles and other quality management initiatives.* Tektronix, Hewlett-Packard, and IBM have introduced activity-based costing to uncover hidden costs associated with products and processes. Activity-based costing demands minute understanding of the company's operations, and its successful implementation requires that accountants actively participate in the operational details.† Another approach is to move to a set of multiple performance measures using a "balanced scorecard" approach.‡ Despite the development of these techniques, integrating the benefits of quality improvement into accounting systems and the guidelines of accepted accounting practices remains an elusive goal.§

*P. F. Drucker, "The Emerging Theory of Manufacturing," Harvard Business Review, May-June 1990, pp. 94-102.

†K. Kelly, "A Bean Counter's Best Friend," Business Week, 25 October 1991, pp. 42-43.

‡R.S. Kaplan and D. Norton, "The Balanced Scorecard — Measures That Drive Performance," Harvard Business Review, January-February 1992, pp. 71-79.

§R.S. Kaplan, "Measuring Manufacturing Performance: A New Challenge for Managerial Accounting Research," The Accounting Review 58 (1983): 686-705.

ously been considered virtually unmeasurable. Indeed, some of the most startling management changes and performance improvements have occurred in nonmanufacturing activities — customer service, sales and marketing, even finance. The application of TQM to Hewlett-Packard's marketing and sales functions is particularly interesting. The company developed a system of metrics to consistently target and report marketing performance.[10] The sidebar, "Accounting and TQM," explains how TQM has triggered fundamental change in management practices in accounting.

Another area that has been greatly affected is product design. Taguchi's work on building quality into design has extended TQM beyond operations management.[11] Taguchi views quality from a customer performance perspective; he emphasizes consistent performance of the final product within specified tolerances. Building quality into design also requires a close linkage between market information and the design process. Quality function deployment (QFD) is an especially powerful technique for closing the gap between design and marketing so that the design properly represents the customer's needs and wants.[12]

The Challenge to Management Theory

We have shown how TQM induces extensive and fundamental change throughout the corporation. But TQM's impact goes beyond management practice. Embedded in the work of Deming, Juran, and other TQM theorists, such as K. Ishikawa, is a philosophy that embraces the purpose of the corporation, the role of work, and human nature. Inevitably, therefore, TQM also carries implications for the principles and theories of management. The conflicts we have observed between TQM and top management-directed plans for strategic change and organizational restructuring are more than a clash of incompatible *management practices* — they also reflect deep-seated incompatibility between the *theoretical principles* implicit within these practices.

Conflict within management theory is no new phenomenon. For much of the past half-century, management theory has coalesced around two broad schools: a "rationalist" school based on the principles of scientific management and the theory of bureaucracy and a "human relations" school based on the role of the organization as a social system, emphasizing psychological and social needs. The differences between these approaches have been caricatured by the labels "Theory X" and "Theory Y."

Some management writers have argued that TQM can bridge these schools. TQM's scientific approach is consistent with the theories of the rationalist school and its work design, and structural components are consistent with the human relations approach. Drucker argues that TQM's ability to link the warring schools of management arises from a critical element — information is fed back to individual employees rather than flowing up to management:

> *By aligning information with accountability, SPC resolves a heretofore unresolvable conflict. For more than a century, two basic approaches to manufacturing have prevailed, especially in the United States. One is the engineering approach pioneered by Frederick Winslow Taylor's "scientific management." The other is the "human relations" approach developed before World War I by Andrew Carnegie, Julius Rosenwald of Sears Roebuck, and Hugo Munsterburg, a Harvard psychologist. The two approaches have always been considered antitheses, indeed, mutually exclusive. In statistical quality control, they come together.*[13]

If TQM is bridging the historical divide between scientific management and human relations management, how do we explain the intensity of conflict we have observed between TQM and other strategic and structural initiatives of the 1980s and 1990s? The reason, we believe, is that the intellectual battlelines have been redrawn. As companies seek to respond to the challenges of our turbulent era, the primary conflict is no longer between "Theory X" and "Theory Y" but increasingly between TQM and approaches to management based on the economic model of the firm.

The economic model has grown out of conventional management theory and standard microeconomics, but it reflects several theoretical developments of the past two decades: agency theory, contract theory, shareholder value maximization, and transactions cost theory. All of these developments share a set of premises:

- the objective of the firm is to maximize shareholder wealth;
- individuals are self-interested, rational decision makers driven primarily by economic goals;
- the economic relationships between individuals are governed by contracts, which may be complete and short term as in the case of market contracts, or incomplete and long term as in the case of employment contracts and the "relational contracts" that govern intrafirm relationships; and
- cost efficiency determines contractual form and institutional structures, whether directly through managerial decision making or indirectly through the forces of competition (i.e., competition is a "selection mechanism" through which inefficient institutional forms are eliminated).

The result is a model of the firm that rests on clear theoretical foundations; shows a high degree of internal consistency; offers predictions that, to a great extent, are consistent with observations; and yields clear and unambiguous normative implications.[14] The corporate restructuring movement of the past decade is a clear example of these normative implications.

TQM, on the other hand, has no explicit theory. Indeed, one of the reasons business schools have been unable to comprehend TQM's power and potential is that it appears intellectually insubstantial. Deming's "Fourteen Points," for example, combine seemingly commonsense principles of management ("institute training," "institute leadership," "break down barriers between staff areas," and "end the practice of awarding business on price tag alone") with a number of folksy, yet quirky, maxims ("drive out fear," "eliminate slogans, exhortations, and targets for the workforce," "eliminate numerical quotas," and "adopt the new philosophy"). However, we argue that a set of theoretical assumptions does underlie the principles and techniques of TQM. Together, these assumptions constitute a management paradigm that contrasts sharply with the economic model.

Organizational Goals

Basic to the conflict between TQM and the economic model are fundamentally different goals. At the root of the economic model is profit maximization, which has been redefined more precisely to mean maximization of shareholder wealth. This principle is legally sanctioned in the requirement that boards of directors operate public corporations in the interests of shareholders. The shareholder value approach has yielded a set of management principles and decision rules that extend well beyond its first fruits — the development of discounted cash flow analysis during the late 1950s. Shareholder value has extended into both strategic and operational analysis on the basis that all management decisions must ultimately be

related to the issue of whether they are creating value for shareholders.[15] During the past ten years, shareholder value analysis has exerted a powerful influence on diversification, divestment, and financial strategies.

TQM emphasizes that the firm's primary objective is providing customer satisfaction. TQM does not reject the notion that a primary objective of the firm should be the pursuit of profit maximization, but it views long-run profitability as an *outcome* of serving customers rather than as a driving force. The risk of using shareholder value maximization to guide decisions is that the firm loses touch with its *raison d'être* — serving the customer. Deming is critical of short-term profitability as a guide to business performance and "the futility of management by the numbers."[16] Thus, although shareholders take a backseat in quality management, their long-term interests are seen as convergent with quality goals: "What value is a 25 percent increase in the quarterly dividend to a company that is out of business five years from now?"[17]

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Convergence and Conflict

These differing goals are critical determinants of company environments. In the economic model, conflict is axiomatic: every individual seeks to maximize his or her economic welfare. For owners, it is wealth maximization; for employees it is maximizing income and non-income benefits and recognizing the disutility of work. Inevitably there is conflict over rent appropriation. Who receives the surplus that the firm earns? The traditional view is that it belongs to the firm's owners. Yet to the extent that human capital, rather than physical and financial capital, is the firm's critical strategic resource, the division of surplus is more complex than a simple conflict between labor and capital.

TQM envisages a convergence of the long-term interests of employees, shareholders, and customers. By improving quality, the organization creates a secure future for itself and its employees. This convergence encompasses both economic and noneconomic goals. Quality improvement can lower costs and give consumers the dual benefit of improved performance and lower prices. Such gains enhance the competitive advantage of the organization, thus offering economic benefits to owners and employees. At the same time, TQM recognizes that individuals are motivated by more than economic gains. As Simon argues, people are "socially dependent creatures" who are "tractable, manageable, and above all, teachable."[18] By encompassing the common interests of consumers, employees, and owners, and by taking account of social welfare rather than a narrower economic welfare, TQM may be viewed as a mechanism for optimizing the firm's contribution to society.

One of the human needs that TQM recognizes is the need to create. Quality is a form of perfection that has intrinsic value; a quality product is a work of art in the sense that it embodies the human quest for perfection. In this sense, TQM represents a return to the values of craftsmanship that have fallen victim to twentieth-century management methods. It is management techniques, rather than production technology, that are primarily responsible for the depersonalization of the production process in U.S. companies: financial management views the firm as a system for maximizing financial returns, marketing management focuses on ephemeral differentiation rather than on consumers' basic needs, and production management has been dominated by the imperative of cost minimization.[19] TQM reasserts the notion that products and services embody the effort, creativity, values, and collective personality of their producers. To this extent, TQM builds on the tradition of sociotechnical systems analysis, drawing in particular on the evidence from many Japanese and Scandinavian manufacturers that advanced production technology is compatible with traditional values of craftsmanship.

Organizational Design

These philosophical differences have implications for organizational structure. In the economic model, agency theory provides a central principle for the design of organizational structure. According to the economic model, each agent (employee) is pursuing self-interested goals. Therefore, the organizational structure must be designed to induce agents to pursue the firm's interests. The agency problem has been analyzed principally in relation to the conflict of interest between shareholders and top management.[20] However, the problem of agency is general to all manager-subordinate relationships. The implication is that the central management problem is to devise incentives and sanctions that align employee behavior with the organization's goals. Two solutions exist. One is to create a hierarchy of principal-agent

relationships where, at each level, managers monitor subordinates' performance and apply rewards and penalties. The other is to introduce market forces within the firm; profit centers and internal contracting arrangements align individual, departmental, and firm goals by diffusing the goal of profit maximization.

But if we accept that quality creates a common goal for individuals who strive for social interaction and acceptance, then our organizational structure will be very different. It will allow employees to coordinate their activities for the common good without organizational impediments. Although little progress has been made in rigorously analyzing the implications of TQM for organizational design, many companies are reconceptualizing their structures. Several companies have inverted their hierarchical structures, reinforcing the notion that top management and corporate staff provide service support for the front-line units. Other companies have moved toward team-based structures. British Petroleum has conceived of its structure as a series of "eggs within eggs" — Quinn Mills identifies this as a "cluster organization."[21] TQM is also conducive to the interactive, nonbureaucratic structures described by Burns and Stalker's "organic" form and Mintzberg's "adhocracy."[22]

However, the critical difference in the conceptualization of organizational structure between the two paradigms is the economic model's adherence to a hierarchical structure with owners and their representatives at the apex and TQM's view of the firm as a system oriented toward serving customers. TQM conceptualizes the firm as a chain of linked processes whose end point is the customer. This emphasizes horizontal structure and coordination of activities rather than vertical structure. Moreover, it points to a departure from the specialization-based approach of grouping similar activities along functional lines. Juran's analysis of product "procession" in which "the product progresses sequentially through all departments, each performing some operation that contributes to the final result" provides a basis for a macro view of organizational structure.[23] Business process reengineering reflects this desire to align organizational structure with the business processes the company performs.[24]

The Role of Information

Within the economic model, the manager's primary role is to prevent and detect shirking by employees. Therefore, managerial access to information is critical to control.[25] Under TQM, information is also essential to decision making, control, and performance, but the information flow is different. If it is assumed that employees are motivated to pursue organizational goals and can make decisions about their own work, then a key requirement is to provide them with sufficient information and feedback to optimize their behavior and interactions. Computer networks have been an important element in making nonhierarchical structures technically feasible.[26]

Dynamic vs. Static Optimization

Like Kodak, a number of firms are implementing large-scale corporate restructurings. The economic model of the firm, with its emphasis on increasing shareholder value, underlies these strategic changes. Corporate restructuring is primarily a top-down process involving vigorous cost cutting though the elimination of underutilized resources, divestment of "peripheral" business and assets, a redrawing of the firm's boundaries through increased vertical deintegration and use of outside vendors, and a stronger orientation toward profitability through tight financial controls.

Both TQM and corporate restructuring are responses to the volatile business environment. Increased international competition, market turbulence, and technological change have necessitated lower costs, increased attention to customers, innovation, and faster responses. But these solutions — TQM and corporate restructuring — are quite different because their underlying philosophies have different orientations toward time.

The microeconomic principles that underlie the economic model are static, and the extension of static, constrained optimization techniques to multiperiod settings (e.g., DCF, multiperiod capital asset pricing) fails to capture the dynamics of complex systems. In several respects, the economic model's view of the efficient organization of production has extended little beyond Adam Smith's classic description of pin manufacture. Thus corporate restructuring emphasizes static efficiency gains through cost cutting, outsourcing, and divestment of underperforming assets.

In contrast, TQM emphasizes dynamic performance improvement. Juran devoted his 1964 monograph, *Managerial Breakthrough,* to analyzing what he perceived as the two modes of management: control and breakthrough. Whereas conventional management theory is primarily concerned with control, breakthrough, which involves "a dynamic, decisive movement to new, higher levels of performance," represents the company's basic urge for survival.[27] It is the means by which managers, over the long term, make their greatest contribution to company performance. Hayes, Wheelwright, and Clark identified the contrast between management as a process of static optimization and of seeking continuous im-

Table 2 Emerging Management Paradigms: TQM and the Economic Model of the Firm

	TQM	Economic Model of the Firm
Organizational Goals	Serving customer needs by supplying goods and services of the highest possible quality.	Maximizing profit (i.e., of shareholder wealth).
Individual Goals	Individuals motivated by economic, social, and psychological goals relating to personal fulfillment and social acceptance.	Individuals motivated only by economic goals: maximization of income and minimization of effort.
Time Orientation	Dynamic: innovation and continual improvement.	Static optimization: maximizing the present value of net cash flow by maximizing revenue and minimizing cost.
Coordination and Control	Employees are trustworthy and are experts in their jobs – hence emphasis on self-management. Employees are capable of coordinating on a voluntary basis.	Managers have the expertise to coordinate and direct subordinates. Agency problems necessitate monitoring of subordinates and applying incentives to align objectives.
Role of Information	Open and timely information flows are critical to self-management, horizontal coordination, and quest for continual improvement.	Information system matches hierarchical structure: key functions are to support managers' decision making and monitor subordinates.
Principles of Work Design	System-based optimization with emphasis on dynamic performance.	Productivity maximization by specializing on the basis of comparative advantage.
Firm Boundaries	Issues of supplier-customer relations, information flow, and dynamic coordination common to transactions within and between firms.	Clear distinction between markets and firms as governance mechanisms. Firm boundaries determined by transaction costs.

provement as the critical difference between U.S. and Japanese management and as the fundamental flaw in the "modern management methods" developed and applied in the United States during the greater part of the postwar era.[28]

One of the dangers of the economic model is that it has reinforced conventional preoccupation with sources of static efficiency at a time when some of the most influential ideas relating to the strategy, structure, and competitive performance of firms, including population ecology and resource-based theory, are concerned with competition as a dynamic process. Recent work on resources and corporate capabilities places special emphasis on dynamic aspects of competitive advantage — investing in irreplaceable, nontransferable assets and upgrading the basis of competitive advantage through innovation and the development of new skills.[29] These ideas are quite compatible with the dynamic orientation of the TQM paradigm.

Dynamic and static optimization also have different implications for organizational structure. Managing for maximization of productivity and minimization of cost in the short term imply the following: specialization; individual incentives linked to quantitative performance in the short term; parsimony in investment and the use of assets; the imposition of short-term financial targets on divisions and business units; and active management of the asset portfolio and divestment of poorly performing assets. By contrast, managing for innovation involves creating organizational conditions conducive to the creation and diffusion of new knowledge.

The Blurring of Boundaries

In the economic model, the distinction between firms and markets is central to analysis of the capitalist market economy. The price mechanism (the "invisible hand") governs external transactions, and administrative processes (the "visible hand") govern internal transactions. The distinction between firms and markets ("islands of conscious power in a sea of market transactions"[30]) is determined by relative costs. Where the administrative costs of hierarchy are less than the transaction costs of market exchange, transactions will become internalized within firms.

TQM's focus on customer requirements blurs the boundaries between companies. Both suppliers and dis-

tributors are part of the production system, and conventional contracts are an inadequate basis for governing their relationships. TQM requires continual interaction, including information sharing and collaboration in technology and design. Within companies, coordination does not consist simply of managerially directed rules and decisions; it is also a process of interaction involving managerial direction, market relations (e.g., serving the internal customer), and voluntary collaboration. (Table 2 summarizes the differences between TQM and the economic model of the firm.)

Such boundary blurring suggests the need to reconsider the nature and functions of corporations and the theory of organization. But on a practical level, manifestations of boundary blurring have included the following:

- the replacement of arm's-length supplier-customer relationships (which are based on competitive bidding, aggressive negotiation of contract terms, maximization of bargaining power, and strategic games involving secrecy and bluff) with dependent relationships;
- the emergence of collaborative partnerships and internal networks within firms in place of hierarchically governed relationships;
- the growth of formal collaboration between firms, including franchises, joint ventures, and various types of licensing agreements; and
- the growth of informal collaboration between firms in bilateral relationships and multilateral network relationships.

Conclusion

Why have experiences with TQM been so variable? At Harley-Davidson and Xerox, TQM has transformed competitive performance; in many other companies, TQM efforts have spluttered and died. Given the nature of TQM, as described in this paper, we maintain that TQM is a revolutionary philosophy that requires radical and pervasive change within the firm. The very popularity of TQM has impeded top management's deep understanding of its ideology and consequences.

TQM's origins and dissemination pattern are quite different from those of almost every other management innovation of the past half-century, and it has bypassed the leading business schools and management consulting companies. As a result, many companies have misunderstood and misapplied it, and it has not received the careful academic scrutiny that has served to give credence and authority to other innovations in organization and management.

TQM calls for systemic changes in management practice, including the redesign of work, the redefinition of managerial roles, the redesign of organizational structures, the learning of new skills by employees at all levels, and the reorientation of organizational goals. Implementation of TQM therefore provides challenges similar to those involved in the management of other revolutionary transitions. The management problem with TQM is analogous to the problems associated with introducing representative democracy into former autocracies and introducing equal rights into racially segregated societies: Once we get it going, how do we keep the lid on it? When the upper echelons of management relinquish their traditional rights and powers, can the process be arrested or reversed? The long TQM road takes companies into a new landscape where authority, decisions, and innovation are much more widely shared. Once a company enters this new territory, it is hard for top management to respond to circumstances that seem to demand sudden strategic shifts. As McDonnell Douglas and Kodak have found, several years of TQM make it difficult for top managers to inaugurate rapid downsizing or divestment.

Thus the first stage in managing companywide TQM programs is to recognize their revolutionary character. The companies that have been most successful in obtaining long-lasting performance benefits from TQM — Xerox, Hewlett-Packard, Nashua, Banc One, and Allen-Bradley — have permitted their quality programs to drive systemwide changes. Top managers must become agents of change, redefining management roles and structure and accepting their own loss of power in the process. Attempting to foster quality improvement in production operations and the lower echelons of the organization while maintaining conventional top-down strategic planning, financial control systems, and active asset management inevitably creates conflict.

But TQM's revolutionary impact goes still deeper. TQM represents a challenge not only to conventional management practices but also to the assumptions and theories on which those practices are based. The theories underlying TQM and the economic model of the firm are inherently incompatible. There are a few examples of companies in which corporate restructuring and TQM have coexisted, but closer examination suggests that the approaches have been used sequentially rather than simultaneously.

Western managers have traditionally prided themselves on being pragmatic, eclectic, and open-minded, but the conflicts between these philosophies suggest that managers and their companies will increasingly need to choose, implicitly if not explicitly, to which school they belong. ◆

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