When Quality Works: A Premature Post-Mortem on TQM

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This article separates the rhetoric of recent criticisms of Total Quality Management (TQM) as yet another managerial panacea from the key components of TQM programs that are well grounded both theoretically and empirically in the extant literature. While TQM has come under much fire for being just another "management fad" by academics, it is ironic that none of these same academics would dare criticize any of its component parts individually. We build upon previous research that identified those key components—leadership and top management commitment, training and education, teams and culture—from the "classic" quality literature and linked them, as a quality-management package, to sustainable competitive advantage. We review how each of these key components has potential elements of tacitness and complexity and, using a systems theory perspective, we detail what happens when these components come together interactively. We go on to show how TQM, as an organization-wide, complex system can produce a culture that embodies open-system attributes that are difficult for competitors to copy. Consequently, our belief is that when the core ideas of TQM are viewed from a systems framework, it becomes easier to understand both the success and failures of TQM as a comprehensive managerial intervention, and not just another "managerial fad."

Much has been written about managerial fads or fashions (Abrahamson, 1996) that are introduced with fanfare but then last only a few years. These fashions include focused approaches such as T-Groups, job enrichment, management by objectives (MBO) and 360° performance appraisals. They also include more extensive, system-wide approaches such as learning organizations, Business Process Reengineering (BPR) and, of course, Total Quality Management (TQM). An interesting phenomenon associated with each of these approaches is that these initiatives, often grounded (at least partially) in managerial concepts supported by academic theory, end up being viewed as failures. Academics, while quick to write the post-mortem for these "fads," often struggle to articulate explanations for the failures. As a result, we provide practitioners (as well as fellow academics) confusing signals about what works and does not work in the practice of management. Our criticisms often throw out the "baby" (empirically supported managerial concepts) with the "bath water" (the rhetoric of the fad).

Attacks on the concept of TQM, the most recent target, provide a case in point (Ahire, 1996; Hackman & Wageman, 1995; Schaffer, 1993). These post-mortems come for varied reasons. Some are quick to dismiss TQM (Boje & Windsor, 1993) or BPR (Wilmott, 1995) as a managerial control mechanism loosely disguised as a method of worker empowerment. Others point to conceptual weaknesses (Schaffer & Thomson, 1992). Still others argue that TQM

itself provides a rhetoric that is individually interpreted and therefore carries inconsistent meaning across contexts (DeCock, 1998; Zbracki, 1998). In sum, if TQM means so many different things to so many different people, then, in practice, it ends up meaning nothing to everyone.

Recent discussions of TQM in both the academic and practitioner literature highlight the difficulty in articulating reasons why some managers and researchers view TQM as a failure while others view it as a success. Hackman and Wageman (1995) point out that many core principles of TQM are diluted in practice. Limited reliance on statistical control processes and increased emphases on pay-for-performance relationships are just two ways that managerial innovations called TQM diverge from the core principles of the founders. This problem is especially evident when arguments are made in support of TQM. Becker argues that when TQM does not work, it is because managers are not truly implementing total quality ideas. Rather, the failure is the result of incorrectly implementing TQM (Becker, 1993).

This confusion points to a misunderstanding of the variety of ways TQM is manifested in different organizational contexts, or it suggests that those who attack the ideas of TQM attack a rhetoric that bears no relevance to the original concept. Missing from the discussions seems to be the possibility that poor management, not poor ideas, may be responsible for the inconsistency of TQM or other managerial interventions.

What makes TQM an interesting case is its pervasiveness. Despite the discussions of its demise, there is still compelling evidence of the effectiveness of total quality initiatives (Easton & Jarrell, 1998). Quality programs, in the form of TQM, have become an "important and prominent approach to management" (Lawler, 1994, p. 68) in an increasing number of firms (Lawler, Mohrman, & Ledford, 1992, 1995; Mohrman, Lawler, & Ledford, 1996; Mohrman, Tenkasi, Lawler, & Ledford, 1995). In addition to the work of Lawler, Mohrman and colleagues, which shows that TQM and "employee involvement" interact to improve firm performance, there is a growing body of empirical research supporting a direct link between TQM and performance (e.g., Hendricks & Singhal, 1997; Ittner & Larcker, 1996; Lemak, Reed, & Satish, 1997; Shetty, 1993). It is also widely claimed that TQM can be used to generate a competitive advantage (e.g., Feigenbaum, 1990, 1992; Hewitt, 1994; Noori, 1991; Reich, 1994; Seawright & Young, 1996; Tobin, 1990). Moreover, the notion of "quality practices" leading to competitive advantage seems to hold in both manufacturing firms (Flynn, Schroeder, & Sakakibara, 1995) as well as in service industries such as hospitals (Douglas & Judge, 2001). It is similarly claimed that TQM leads to sustainability of advantage (e.g., Cyert, 1993; Flynn et al., 1995; Harber, Burgess, & Barclay, 1993; Hendricks & Triplett, 1989; Spitzer, 1993; Tilton, 1994).

TQM is in essence a strategic management approach (Wruck & Jensen, 1994) and a business-level strategy (Reed, Lemak, & Montgomery, 1996). Understood this way, it is not just another in a long line of managerial tactics that offer promise only to fade away (See Hackman & Wageman, 1995 for a discussion of this possibility). When TQM is viewed from a "how to perspective" comprised as a list of "turn key" management techniques that when implemented will be the panacea of organizational performance, it can't help but fail miserably. However, when it is viewed as an integrated system of well-developed, proven managerial

practices driven by committed leadership, its chances of improving organizational performance is significantly improved.

The purpose of this article is to isolate the rhetoric from the combined set of managerial concepts of leadership, training, teams and culture that are identified by Crosby, Deming, Feigenbaum, Ishikawa, and Juran as being key for improving quality within organizations. We explain how these managerial concepts combine within the total quality backdrop to produce theoretically sound, empirically grounded ideas in the practice of management.

THE FOUNDATIONS OF TQM

In the process of generating a theoretical rationale for the relationship between TQM and sustainable competitive advantage, Reed, Lemak, and Mero (2000) reviewed the classic quality-management literature to identify the concepts the founding authors deemed important (see Table 1). By returning to the seminal works of Crosby (1979, 1996), Deming (1982, 1986), Feigenbaum (1991a), Ishikawa (1985), and Juran (1951, 1962, 1974, 1988, 1989, 1992, 1995) they avoided the risk of being sidetracked by each new variation that came along. For example, other studies have found as many as seven common practices that make up a TQM program (e.g., Douglas & Judge, 2001). But, it is readily apparent from the original works of the seminal authors, and from various summaries of these works (e.g., Gehani, 1993; Harrington, 1995), that there are only a few specific commonalties that have withstood the test of time.

Crosby, Deming, Feigenbaum, Ishikawa, and Juran unanimously agree that TQM will not work without leadership from top management, and those managers' visible, demonstrated, and long-term commitment. They also recognize that people have to be educated about quality concepts, and they have to be trained in the use of quality tools and techniques. Similarly, solving quality problems requires cross-functional communication throughout the organization, which means establishing and using teams. Finally, there is agreement that TQM requires an organization culture where all individuals are concerned with quality, want to produce quality products, and where they can freely question practices that do not produce quality.

In the next section we build on the work of Reed et al. (2000) and explore issues of tacitness and complexity in leadership, training, teams, and culture. Then, where Reed et al. provided an overview of a system's theory (Kast & Rosenzweig, 1972) approach to TQM, we explore it in detail. The insights gained in that analysis create the foundation for new insights into how leadership, training, and teams underpin an organization's culture to create what Barney (1986) described as a valuable, rare, and imperfectly imitable resource.

TACITNESS AND COMPLEXITY IN THE COMPONENTS OF TQM

It has become conventional wisdom in the strategic management leadership that tacitness and complexity in resources create barriers to imitation. Tacitness is skill-based and arises from the "learning by doing that is accumulated through experience and refined by practice," and complexity arises from the interrelationship between skills and between skills and assets and includes the inter-action of "technologies, organization routines, and individual- or team-based experience" (Reed & DeFillippi, 1990, p. 91).

TABLE 1
Commonalities in Concepts Used in the Seminal TQM Work*

Concept/Author	Crosby (1979, 1996)	Deming (1982, 1986)	Feigenbaum (1951, 1961, 1983, 1991a)	Ishikawa (1985)	Juran (1951, 1962, 1974, 1988, 1989, 1992)
Leadership & Top Management Commitment	Leadership by example; commitment demonstrated by participation and attitude.	Management's job is leadership—to show constancy of purpose in their focus on quality.	Requires complete support of top management, who realize it is not a temporary cost-reduction project.	Top management commitment should be shown by adopting the lead role in implementation.	Top management's job is motivation, which includes participation in quality programs.
Employee Training & Education	Training in quality, from the CEO down, to internalize concepts; training and education should be continuous.	Vigorous, continuous program for training employees in new knowledge and skills; statistical methods to check training efficacy.	Training (on-the-job, classroom, problem solving) and education is fundamental to achieving full commitment to quality.	TQC is a revolution in thinking, so training and education must be continuous for all employees (from the CEO down).	To make quality happen, training should include the entire hierarchy, starting at the top: purpose of training is to create or update skills.
Teams	Management team on quality for internal communication, quality councils for internal/external communication.	Cross-functional teams can create improvements in product, service, quality, and reduce costs.	Quality-control committees should have representatives from all functional areas.	Cross-functional committees (teams) facilitate the responsible development of quality assurance.	Major quality improvement projects are multi-functional in nature, thus requiring multifunctional teams.
Culture	Quality commitment: genuine belief by employees in importance of good quality, workmanship, good designs, and service.	A new philosophy is required: drive out fear (of quotas, questioning accepted methods, etc.), and instill pride in quality.	Quality control is a "spirit of quality mindedness," from CEO to the shop floor; it is a communication channel and means of participation.	TQC requires organization-wide participation—where there are no (voluntary) quality-circle activities, there is no quality control.	Changing to a company-wide quality system means changing existing cultural patterns; there may well be cultural resistance.

* Adapted from Reed, Lemak & Mero (2000)

Leadership and Top Management Commitment

The view that executive competencies can be a source of sustainable competitive advantage is well established in the management literature. Polanyi (1967) discussed the importance and tacit nature of executive skills and, more recently, Castianas and Helfat (1991, p. 157) have argued that "top management ... makes and implements strategic and operational decisions that are not competed away by other firms and managers." They identify three basic types of managerial skill—generic, business or industry-related, and firm-specific skills—that are rooted in innate abilities or learning. These skills, they argue, are an intangible resource, and are thus protected from imitation. Although undoubtedly correct, this conclusion does not explain fully the barriers to imitation that can arise from leadership and top management commitment.

Leadership. Given the emphasis that Crosby, Deming, and the other authors of the seminal TQM literature put on top management's role in implementing TQM, it is somewhat surprising that the topic has received only limited attention within TQM research. Of the few that have addressed the topic, Puffer and McCarthy (1996) provide an enlarged framework for leadership in a TQM context and they argue that top management's ability to create a vision and promote change is at the heart of successful TQM implementation. In other words, top management needs transformational-leadership skills. The literature on transformational leadership is extensive (e.g., Bass, 1985; Bass, Avolio, & Goodheim, 1987; Bass, Waldman, Avolio, & Bebb, 1987; Burns, 1978; Podsakoff, MacKenzie, & Bommer, 1996; Podsakoff, MacKenzie, Moorman, & Fetter, 1990) and includes work on charismatic leadership (e.g., House, Spangler, & Woycke, 1991). Applying the arguments in that literature to TQM means that top management inspires employees to focus on customer needs and adopt new work practices in the name of improved quality. Managers thus have to communicate their values on quality, articulate and communicate their vision for change, and provide confirmation of the importance of change with both directive and supportive behavior. Top management's vision for the future can be a source of competitive advantage (Collins, 1991; Feigenbaum, 1991b; Hamel & Prahalad, 1994; Schoemaker, 1992) and, as Lado and Wilson (1994) and numerous others have pointed out, that vision is inherently tacit in nature.

In addition, TQM demands that executives be able to deal with a variety of influences coming from external stakeholders (Puffer & McCarthy, 1996). Over twenty years ago, Mintzberg (1973) stressed the importance of the interpersonal role of managers and emphasized that their expertise depends upon tacit learning. That tacit learning is now needed even more to support their new roles as cheerleaders for employees and celebrities for customers and investors.

Not only is there tacitness present in the leadership function, there is also complexity. The roles of cheerleader and celebrity notwithstanding, at the heart of transformational leadership is the ability to create and communicate a vision. Daft and Weick (1984) pointed out that the creation of a vision depends upon contextual factors in the firm's environment, the answer being sought (e.g., improved quality), and the previous experience of the person creating the vision. Arguably, the interaction between these three factors, with its consequent complexity, will produce barriers to imitation. The model proposed by Robbins and Duncan (1988), which has contextual factors of industry, culture, structure, and leader behavior, and a process

including the separate phases of sense-making and vision creation, will generate even higher levels of complexity.

Top management commitment. In addition to leadership, the seminal TQM literature declares that commitment from top management is important. We need to stress that we are referring to *commitment by top management* in a typical managerial context. This is not to be confused with the separate body of literature in Organization Behavior referred to as "organizational commitment." With regard to the former, there is little discussion on the subject within the management literature. Where it is mentioned, it is usually in passing, and it is simply perceived as being an affective or cathartic state (e.g., Zaleznik, 1989).

The notion of commitment considered by Locke and colleagues (Locke & Latham, 1984; Locke, Latham, & Erez, 1988) is useful in providing an understanding of the role of commitment to achieving tacitness and complexity. The focus here is an individual's attachment to a goal regardless of the goal's origin. This type of commitment can lead to perseverance in the face of obstacles to goal attainment (McCaul, Hinsz, & McCaul, 1987) and has traditionally been used in studies of overcoming resistance to change. The willingness to persevere towards a course of action is, at least partially, a function of the connection of the identity of the top management and the success of the TQM intervention. In other words, if the organizational direction to pursue TQM is publicly announced (as it most certainly would be) top management commitment would be considerably higher and more a unique function of the individual manager.

Top management behavior and action that links their ego or reputation to the achievement of a goal or the success of an intervention (such as TQM) contributes to their commitment in a more significant way than if that course of action were directed from the outside or accepted as an emulation of a strategy that was effective elsewhere. If such is the case then, of course, commitment is wholly tacit in nature and will thus create a barrier to imitation. But, even without this form of commitment, we can deduce from the process by which commitment arises that there is an inherent complexity that limits the potential for imitation.

Employee Training and Education

Training is recognized as being a cornerstone of the continuous learning that exists in successful organizations. For example, Brown and Karagozoglu's (1993) study of accelerated new product development showed that training was a key part of the strategy for competitiveness in over half of the hi-tech firms in their sample. In a survey of higher-performing organizations, it was found that some 3.3% of payroll costs were dedicated to training compared to a recommended industry-norm of only 1.5% (Kimmerling, 1993). And, not surprisingly, research has also shown that training improves quality (Pfeffer, 1995). Schonberger (1992) discussed the role of training as a link between an organization's quality-management strategy and its ability to create and maintain a competitive advantage. Unfortunately, there are no clear statements in the literature on how training actually achieves this linkage. Training may be a resource in its own right. But if not, it obviously has the capacity to create the resources on which an advantage could be based.

From the seminal TQM literature, we can deduce that training is primarily a vehicle for implementing and reinforcing quality practices. Deming makes much of training employees

in the use of statistical techniques. We refer to these skills as "hard skills" in that they center on the use of statistics, sampling methodologies, and other quantitative kinds of tools. However, even Deming goes on to suggest that there is much more to training than just teaching employees these "hard skills." Training is the way to create new skills within the organization—teaching specific skills for production, for problem resolution, team participation, interpersonal skills, and much more. These, we term the "soft skills." In a survey of American companies with more than 100 employees, it was found that more than 60% of firms in the sample provided training in quality, team building, communication, problem solving, and decision making (Anonymous, 1994). In Crosby's terms, training and education internalize the philosophy of quality and its attendant activities. In other words, employees are trained to look at quality from the perspective of the customer, to understand the relationship between quality and revenues, and quality and costs. Similarly, for Feigenbaum and Ishikawa, training is a means of achieving commitment and revolutionizing thinking.[1] Thus, training has the potential to generate tacitness in the form of new skill sets, and it can also be used to change perceptions of the value and role of quality. Support for these arguments exists within the empirical research on training. For example, training has been found to have behavioral and attitudinal influences (Burke & Day, 1986; Shani & Rogberg, 1994; Sommer & Merritt, 1994) and to have effects on awareness (Easton, 1993).

Although the arguments for a link between employee training and complexity are not as rich as those for the link with tacitness, they do exist. Research in quality management has pointed to the need for organizations to consider the unique characteristics of the organizational context (Moras, Sanchez, & Ford, 1994). For example, Murray and Raffaele (1997) found that training had a positive effect on quality and costs, and thus generated a positive return on the investment in training, but they also found that the effect was moderated by the contextual factor of the production process. Given that such contextual factors affect all aspects of TQM, it is fair to conclude that there exists the potential for complexity. Training activities will become difficult for competitors to imitate as they are modified to become situation specific to generate the maximum returns from interactions with contextual factors.

(Cross Functional) Teams

Cross-functional teams are typically composed of members who are functionally identified with other subunits of the organization (Alderfer, 1987; Alderfer & Smith, 1982; Brown, 1983). Such teams can serve a variety of purposes including the integration of activities, boundary spanning, and generating production efficiencies (Ford & Randolph, 1992; Ancona, 1990; Hitt, Hoskisson, & Nixon 1993; Takeuchi & Nonaka, 1986). It is worth noting here that all of these purposes feature prominently in the discussions in the seminal TQM literature on the benefits of teams. Similarly, teams are appropriate when there is a need for the coordination of activities, where work needs to be creative due to a rapidly changing environment, or where major breakthroughs in performance are required. Research has shown that in addition to providing an innovative approach to production issues, cross-functional teams also can help reduce product-development times (Eisenhardt & Tabrizi, 1995). In short, teams have the capacity to become a valuable resource. However, the effectiveness of

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[1] These arguments imply that the TQM process is a complex system. We return to this issue later when we consider TQM from a systems theory perspective.

teams is dependent on the organization's commitment to their use (Bettenhausen, 1991), and other contextual factors such as inter-team coordination, autonomy and power, relationship of members with the functional organization, accessibility of resources, clarity of mission, and reward systems (Denison, Hart, & Kahn, 1996).[2] Denison et al. went on to propose that team effectiveness may be best measured not just by traditional outcomes, such as productivity or team-member behaviors, but also by the development or creation of new knowledge and improved processes, including new conceptualizations of tasks. In other words, the outcomes of team activities include new ideas, new knowledge, and new skills. Inter-functional coordination, activity integration, the generation of new ideas, and so forth, are all activities that are difficult to codify and, instead, are more typically learned by doing; i.e., they are tacit.

Teams can also contribute to tacit outcomes through the intra-team relationships. Teams develop unique processes and norms that are used as control mechanisms that are significant factors in influencing overall team effectiveness (Barker, 1999). Barker suggests that this "concertive control" is a process that is unique to a particular group and creates a unique discipline for working within the team. Intra-team discipline, inter-functional coordination, activity integration, the generation of new ideas, and so forth, are all activities that are difficult to codify and, instead, are more typically learned by doing; i.e., they are tacit. We therefore submit that there is substantial potential for the creation of barriers to imitation from the use of teams in the TQM process.

It has also been argued that team composition—the heterogeneity of team members—affects performance and outcomes (Bettenhausen, 1991). Both demographic diversity and functional diversity, such as that typically found in cross-functional teams, have been used as measures of heterogeneity. Jackson, May, and Whitney (1995) concluded that heterogeneity in teams was related to creativity and, ultimately, to decision-making effectiveness (also see Jackson et al., 1991). Bantel & Jackson (1989) found that organizational innovations were positively associated with the increased functional heterogeneity of teams in the banking industry. In some cases team performance increased for culturally diverse teams (after an initial period of lower performance) when creative problem solving was used as a measure of performance effectiveness.

A recent meta-analysis considered the results of 13 studies (57 different hypothesis tests) and found a small and insignificant effect of overall homogeneity and heterogeneity on overall performance (Bowers, Pharmer, & Salas, 2000). However, the authors did conclude from their review of these studies that homogenous teams benefited most in task situations where the problem was well defined, little integration of data was needed, and the required response was less complex (Bowers et al., 2000). In other words, homogenous teams performed well in situations where there was little need for input from multiple perspectives. This conclusion is consistent with the findings of others that team heterogeneity contributes to performance when the task is complex and when the team must consider a wide range of options (Bantel, 1994; Bowers et al., 2000).

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[2]   As per the previous footnote, the arguments made here on teams are beginning to reflect the fact that the TQM process is a complex system.

While there is still speculation about the mediating processes that influence the effectiveness of diverse groups (Jackson et al., 1991), it appears that the different perspectives that result from team diversity provide a greater illumination of problems that, in turn, leads to more creative solutions. When teams are composed of members with varying organizational perspectives, there should be better information available about potential problems that may occur down the line (Imai, Ikujiro, & Takeuchi, 1985; Gold, 1987; Eisenhardt & Tabrizi, 1995; Gold, 1987; Imai, Ikujiro, & Takeuchi, 1985). Thus, it can be argued that teams with cross-functional perspectives can minimize the pursuit of courses of action that will fail.

The causal link between team-member heterogeneity and performance is mirrored in a link between heterogeneity and complexity. Individuals representing different functional units bring unique experiences and backgrounds to the team environment and, as the diversity of team membership increases, the resulting complexity of any outcome from the team is subject to an exponentially more complex set of causal factors. Thus, the greater the functional heterogeneity of teams, the higher the barriers to imitation.

Culture

Over the years, extensive theoretical and empirical research has led to an understanding of culture as being the values, beliefs and norms that guide behavior in organizations. For example, Schein (1996, p. 236) defined culture as "the set of shared, taken-for-granted implicit assumptions that a group holds and that determines how it perceives, thinks about and reacts to its various environments." Deming's call to "instill pride in quality," and Crosby's call for a "genuine belief by employees in the importance of quality workmanship, good designs and service" (see Table 1) fit closely with that definition. An examination of the classics in TQM quickly reveals that concern for quality should stretch beyond functional areas to include all managerial levels and be, in effect, a central feature of the organization culture.

Fiol (1991) argues that the link between behaviors and their social meaning is missing from the organization culture literature. She goes on to explain that it is cognitive processes that bring meaning to behaviors. She also contends that a focus on those processes can be a source of competitive advantage and, consequently, there is a need for an identity-based approach to managing organizational competencies through culture by linking identities with behaviors and values:

> The close correspondence of identities and the behavioral contexts from which they emerge leads to the possibility of consciously managing their evolution. The presence of a larger rule system, which serves as a central referent for multiple identities, leads to imperfectly imitable links between discrete behavior and the beliefs that guide them (1991, p. 203).

What Fiol (1991) is arguing for is a complete and comprehensive "re-engineering" of the culture within which employees are shown the entire context of the change (i.e., TQM becomes the central referent). Fiol's concepts of "identity" are similar to notions of "genuine belief" and "philosophy" that appear in the seminal TQM literature. All of these concepts are tacit.

On the question of culture and complexity, the knowledge-based theory of the firm suggests that, like shared assumptions, beliefs, and values, common knowledge plays a role. Grant

(1996) argues that the integration of knowledge throughout the organization, which occurs through language, other symbolic communication, commonality of specialized knowledge, shared meaning, and recognition of individual knowledge domains, allows all members to share in that which is not common. He goes on to suggest that the integration of knowledge is a source of organizational capability (i.e., a resource) which is, in turn, a fundamental source of competitive advantage. He states, "The broader the scope of knowledge integrated within a capability, then the more difficult limitation [*sic.* "imitation"] becomes. The complexity of 'broad scale' integration creates greater causal ambiguity and greater barriers to replication" (1996, p. 117).

From Grant's arguments it is but a small step to the conclusion that a culture based on the shared knowledge of TQM creates a complexity that prohibits imitation by competitors.

TQM AND SYSTEMS THEORY

Reed et al. (2000) argued broadly that leadership, training, teams and culture form a complex system that heightens barriers to imitation of competitive advantage. While correct, that argument leaves much unsaid because systems themselves can be viewed in terms of both tacitness and complexity. Figure 1 portrays systems concepts in terms of low and high levels of both tacitness and complexity (definitions for the systems concepts are shown in the Appendix).

Cell 1, Low Levels of Tacitness and Complexity

We again start with top management commitment and leadership and suggest that the kinds of things that are done initially to launch a TQM effort are relatively low in complexity and tacitness simply because the interactions are just starting. Using some attributes of systems (but in an operational sense), we suggest that top managers start by changing the organization in terms of structure, function and differentiation (specialization). For example, top management might assemble a task force to articulate and implement a TQM strategy.

Figure 1. TQM and Systems Theory: The interaction of tacitness and complexity.

Alternatively, they could add a specific office to the existing hierarchy to deal with quality issues and/or include quality functions in the already established strategic business units or departments. Obviously, this is a relatively easy thing to do, and one that is easily imitated by competitors. Because of the large body of the "how to" genre of literature that exists to help managers in this first stage of TQM, there is, by definition, little here that is tacit or, for that matter, relatively complex.

Cells 2 and 3, Mixed Levels of Tacitness and Complexity

Cell 2, which really speaks to the issue of developing "hard skills," moves the firm to higher levels of complexity but not particularly high levels of tacitness. This stage involves training in any number of TQM-related tools such as SPC and all their variants. This produces complexity because there are so many TQM tools to choose from (again, there is a large volume of literature in this area). However, any firm can learn how to train their employees in any number of these techniques that they choose, so tacitness is not an issue. Going back to our systems attributes, we suggest that these TQM tools can be effective in reaching high levels of integration (between differentiated units/teams) using things like task forces, committees, and multifunctional teams. Such training can also make employees aware of ways to seek multiple goals simultaneously (i.e., organizational, sub-unit, team and individual). Finally, by emphasizing the systems notion of "cycles of events," employees and teams can be trained in any number of ways to improve quality through things like sampling, waste reduction, reducing cycle times, etc. Depending on how extensive this training is and how committed top management is, the result can be teams that are equipped to engage in many types of complex skills that can contribute to a successful TQM strategy.

Cell 3 focuses on the development of the TQM "soft skills" which lead to the development of an employee identity that is centered on quality. The basic idea in this education process is to instill the employees with a sense of pride and a value system that is quality oriented. Unfortunately, there is no easy way to accomplish this successfully despite all that has been written about change management and organization culture. The literature has identified some key issues in this process, but there are no easy-to-follow, checklist type formulae that achieve the desired results in any consistent manner across organizations. Rather, successful efforts in this area are characterized by organizations which seem to have "just done it" and have learned by doing (witness the wide variety of cultures in successful high-tech firms).

One way to think about this phenomenon in systems theory is the notion of internal elaboration which states that open systems tend to move towards ever higher levels of differentiation to deal with a dynamic, ever-changing environment. Tacitness would seem to be the key to using the "soft skills" training process to encourage creativity and critical thinking as part of a new quality-oriented culture. The second systems attribute that is relevant to this discussion is equifinality—the notion that the same result can be achieved in any number of ways. Many, many organizations have been able to develop quality-oriented identities in their employees and they have accomplished this no matter what specific avenue is taken. Again, tacitness seems to be critical in achieving the desired result in any number of ways. Thus, the secret to making the successful transformation from education to a quality-oriented identity in individuals seems to reside in the ability of the firm to learn by doing, and in doing so, discover something that cannot be imitated by its competitors.

Cell 4, High Levels of Tacitness and Complexity

Cell 4 is the essence of achieving sustainability of competitive advantage. Here, high levels of complexity and tacitness combine in a unique fashion to embody four attributes of open systems. First is synergy. Everything the firm has done correctly in quality management feeds on itself and results in a strong, success-oriented culture whose whole is more than just the sum of the individual parts. Moreover, the organization is successful because its culture has manifested itself in terms of requisite variety—it is as diverse and complex as its external environment. Finally, the idea that "success breeds success" is representative of the systems attribute of dynamic homeostasis. Once a system has achieved equilibrium at some sustained level, it tends to want to remain there. Thus, once a firm creates a culture that thrives on its quality orientation and achieves success, it tends to keep doing the kinds of things that sustain those efforts over the long term.

In other words, culture is the key to maximum sustainability of advantage—a view that fits well with Barney's (1986) resource-based arguments on culture as a source of advantage. Turning once more to the work of Crosby, Deming, Feigenbaum, Ishikawa, and Juran, it is possible to divine from their discussions that the antecedents for quality management are leadership and motivation, and that the outcome is an organization-wide spirit, philosophy, and belief in quality (i.e., culture). The vehicles for moving from the antecedents to the outcome are education and training and teams (see Figure 2).

Leadership and commitment to quality is manifested in two ways. There is a commitment in resources to train employees in quality skills and techniques—the "hard skills" of TQM— and management exercise leadership by providing a means to educate (cynics would say "indoctrinate") the employees in the values and philosophy of TQM—the "soft skills." As training and education focus on the idea of building a "TQM identity" (Fiol, 1991), the values and worth of quality improvement efforts that lead to the accomplishment of team goals, as well as organizational goals, emerge. The purpose of the training is also to make teams (self-managed or otherwise) function effectively so that employees work together to increase quality. Thinking in terms of teams, and in team terms, thus becomes part of the culture.
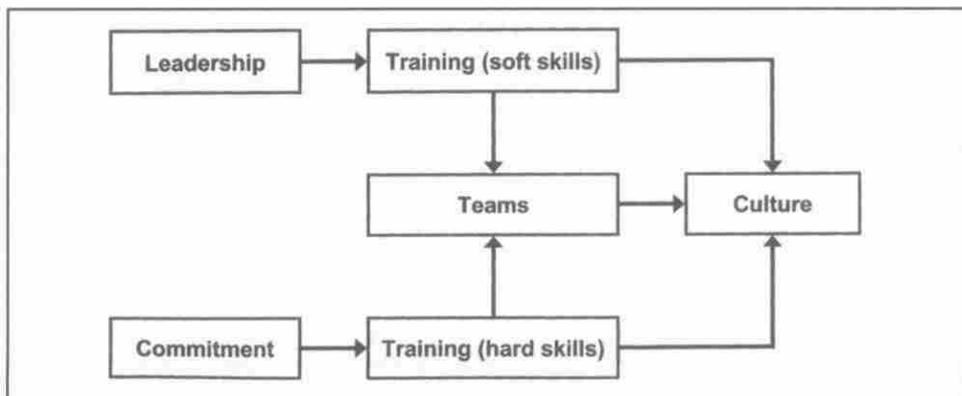

Figure 2. TQM as a complex system.

CONCLUSION

Implementing a complex system like quality management, with all the serial interactions, is a difficult task. In fact, many of the "TQM failures" may be attributed more to the failure to implement and manage them as a system and less from any fundamental flaws in the system or its components. Consequently, the recent attacks on TQM in the academic literature seem oddly out of sync with theory and the growing body of empirical work that demonstrates the performance effects of quality management programs (e.g., Hendricks & Singhal, 1997; Ittner & Larcker, 1996; Lemak et al. 1997). Despite the growing and convincing body of evidence that TQM improves financial performance, there is still theoretical and empirical work that needs to be done. On the theory side, more work on TQM content within specific industries would help us understand TQM in specific contexts (e.g., retailing or airlines) and move beyond generic models (e.g., Reed et al. 1996). On the empirical side, there is a great deal of theory out there that needs to be tested, including this one. One need only pick up a copy of the *Journal of Quality Management*, for example, to find much in the way of macro and micro theories that need to be validated through empirical research. Finally, there still exists the gap between academics and practitioners that needs to be narrowed so that seemingly "good ideas" that have intuitive appeal are separated from solid theory that has been tested.

We would like to leave the reader with this thought. The separate managerial components of TQM (i.e. leadership and top-management commitment, employee education and training, teams, and culture) are, in and of themselves, critical managerial concepts. While each has a rich body of literature that provides important insights individually, they have not been combined theoretically in the manner proposed in this paper. Below is a summary of broad conclusions that can be derived from the original literature that led to the introduction of TQM in American business. Individually, it would be heresy to attack concepts and conclusions such as:

- Leadership matters and organizational success begin with the leader's strategic role.

- Managerial commitment is critical to ensuring the success of any organizational change— especially one as comprehensive as TQM.

- Training is necessary to provide the technical skills of improving quality as well as to train organizational members in team processes and to understand their role in the new (quality focused) environment.

- Teams are an important and effective method of organizing and are critical to quality concepts because they facilitate sharing information and provide the organizational mechanism to incorporate change.

- For change to be long lasting, it must become a part of the organizational culture where quality is emphasized and continuous improvement is mandated.

It is ironic then that when these same managerial principles are combined under the rubric of Total Quality Management, it is not only an accepted practice, but it has become fashionable to attack them, despite evidence that firms are still using and benefiting from quality

management. Indeed, to paraphrase a quote from Mark Twain and apply it to TQM, "the reports of my death have been greatly exaggerated."

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APPENDIX

Characteristics of Open Systems

Differentiation: Because the environment is complex with many different elements, the system (organization) must break itself into specialized subsystems (subunits) to deal with all those various elements.

Integration: The coordination of all the various subsystems (subunits) in the system (organization) to achieve unity of direction and purpose.

Synergy: The whole is greater than the sum of the parts.

Holism: Systems are total, complete entities. One cannot understand them by taking them apart (analysis). Instead one must look at the complete system and its interrelationships with other systems (synthesis).

Internal Elaboration: The tendency of open systems to move towards ever higher levels of differentiation (adaptation) to deal with a dynamic, ever changing environment.

Requisite Variety: The internal regulatory mechanisms of a system must be as diverse (complex) as the external environment with which it interacts.

Equifinality: Alternative means exist for every end. A system can reach a particular end state through any of a variety of means.

Systems as Cycles of Events: Inputs are transformed into outputs. But then conversion of output back into input occurs through a feedback mechanism that keeps the cycle ongoing.

Dynamic Homeostasis: Since input and output exchanges with the environment are necessary, the system attempts to stabilize those exchanges in order to smooth out the exchange process. Systems strive to achieve equilibrium.