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Total quality management and sustainable competitive advantage

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Abstract

Although it is generally accepted that Total Quality Management (TQM) can generate a sustainable competitive advantage, there is, surprisingly, little or no theory to underpin that belief. Therefore, the primary purpose of this paper is to explore the validity of the claim. By drawing on the market-based theory of competitive advantage, resource-based theory of the firm, and systems theory, we are able to conclude that the belief is warranted. We deduce that the content of TQM is capable of producing a cost- or differentiation-based advantage, and that the tacitness and complexity that are inherent in the process of TQM have the potential to generate the barriers to imitation that are necessary for sustainability. © 2000 Elsevier Science Inc. All rights reserved.

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1. Introduction

There is a growing body of empirical research supporting a direct relationship between the adoption of Total Quality Management (TQM) and improved firm performance (e.g., Easton & Jarrell, 1998; Hendricks & Singhal, 1997; Lemak et al., 1997; Samson & Terziovski, 1999;

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Shetty, 1993). Given the theoretical link that exists between competitive advantage and performance, it is perhaps not too surprising that it has been claimed that TQM or similar quality management practices can be used to generate a competitive advantage (e.g., Curkovic & Pagell, 1999; Feigenbaum, 1990, 1992; Hewitt, 1994; Noori, 1991; Reich, 1994; Seawright & Young, 1996; Tobin, 1990). It has also been claimed that TQM leads to sustainability of advantage (e.g., Cyert, 1993; Flynn et al., 1995; Harber et al., 1993; Hendricks & Triplett, 1989; Spitzer, 1993; Tilton, 1994). There is an obvious intuitive appeal to these ideas and, from the number of times that the presumption of causality arises within the literature, it is apparent that they have gained face validity. But, intuitive appeal cannot substitute for theoretical grounding. The fact remains that there is no theoretical model to underpin these claims. Without sound supporting theory, it will be difficult to move quality management research to the next level. Therefore, the purpose of this work is to help fill the theoretical void that still exists between TQM and sustainable competitive advantage.

Theory building in TQM was launched with the publication of the July 1994 special issue of the *Academy of Management Review*. The lead article in that issue (Dean & Bowen, 1994) did an effective job of mapping out the TQM theory landscape in terms of three dimensions—areas in which TQM overlapped with traditional management theory, areas where TQM practice could be enhanced by current theory, and areas unique to TQM. Most theory building since then has occurred, not surprisingly, in the first area, where ideas from the larger body of literature can be expanded or honed to specific applications in the quality literature. The result of that endeavor has been theory mainly at the micro level of analysis in areas such as organization behavior (e.g., Shea & Howell, 1998), organizational change (e.g., Jenner et al., 1998; Reger et al., 1994), leadership (e.g., Puffer & McCarthy, 1996), and human resource management (e.g., Cardy & Dobbins, 1996; Waldman, 1994). Much less has been done at the macro level of analysis, even though some initial groundwork was laid in areas such as organization systems (e.g., Spencer 1994), contingency theory (Sitkin et al., 1994), organization culture (Manley, 1998), and strategy (Reed et al., 1996). Our research adds to the macro level work that views TQM through the strategy lens. Here, we offer theory that is grounded in the strategy literature that shows how TQM is capable of not only generating a competitive advantage but also providing sustainability.

We start on our task by providing some key definitions. We have adopted Reed et al.'s (1996, pp. 173–174) view of TQM as “a business level strategy . . . [with] . . . components of process and content.” Establishing that TQM is a business level strategy is important because it is at the business level where competitive advantage occurs. Content describes what the strategy does. In the case of TQM, for example, it can include improving product quality to help increase sales and revenues (Reed et al., 1996), or reduce risk (Kroll et al., 1999). Process, however, is concerned with how the strategy is implemented. For TQM, that can include things like the use of teams to iron out inefficiencies in manufacturing processes. Competitive advantage is the outcome of a strategy that generates increased value for a firm, relative to its competition, and sustainability is present if the increased value remains when competitors stop trying to imitate the advantage (Barney, 1991).

Following this introduction, we spend some time establishing what is included within TQM content and process. Then, after briefly exploring theory on competitive advantage, we argue that the creation of an advantage is centered mainly on issues of TQM content, whereas

sustainability arises from the process side of TQM. To establish this second point, we use the constructs of tacitness and complexity, which are the main drivers of barriers to imitation. Where tacitness works as a stand-alone construct, establishing the notion of complexity in TQM requires that we also draw on systems theory. The paper is rounded out with a discussion on the implications for research and practice.

2. TQM content and process

Crosby (1996, pp. 22) observed that “Each [new] article on quality picks up the mythology that has gone before.” Therefore, in an attempt to maintain rigor, we have elected to return to the seminal works on TQM to ground our theoretical arguments. To establish what is included in TQM content and process, we have used the works of Crosby (1979, 1996), Deming (1982, 1986), Feigenbaum (1951, 1961, 1983, 1991), Ishikawa (1985), and Juran (1951, 1962, 1974, 1988, 1989, 1992).¹

We have identified two areas where complete agreement exists among the authors on the purpose of quality. All the authors emphasize that the customer defines quality and, in turn, that quality creates customer satisfaction which leads to an improved competitive position. Equally consistent is the view that the costs of waste and rework are high and should be eliminated. These two items—improving customer satisfaction and reducing costs—explain what the strategy can achieve and thus constitute content. We also identified four areas of unanimity on the management of the process: leadership and commitment, training and education, using teams, and having the appropriate culture (see Table 1). It is vigorously pointed out and unanimously agreed by the authors that TQM will not work without the demonstrated long-term commitment of top management. It is also universally recognized that neither managers nor employees are omniscient—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 at various levels through the organization, which typically means establishing and using teams. Finally, there is agreement among the authors 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.

Other areas exist where there is agreement among the authors, but there is neither unanimity nor uniformity of emphasis. For example, four of the authors stress that the use of statistical tools for analysis helps improve control, but Crosby (1996) does not support that idea. Although he does not completely dismiss the idea of measurement and control—he suggests an alternate approach for rating the “complete transaction”—he does go to some lengths to explain his view that the use of statistical tools is not at the heart of quality

¹ Taguchi may also be considered one of the founders of the TQM movement. But, because his work is primarily concerned with technical issues in the design of products and production processes (i.e., “robust quality”), we have not included him in the analysis of the work of the other founders of TQM who concentrated more on management issues.

Table 1
Commonalities among seminal TQM work

Concept/author	Feigenbaum (1951, 1961, 1983, 1991)	Juran (1951, 1962, 1974, 1988, 1989, 1992)
Customer satisfaction	Quality is what the customer says it is; customer focus is embedded in the management of quality.	Customer satisfaction, which drives market share and profits, comes from product satisfaction.
Cost reduction	Controlling quality costs less than correcting mistakes.	Costs of poor quality remain unknown, but they are very high.
Leadership and top management commitment	Requires complete support of top management, who realize that it is not a temporary cost reduction project.	Top management's job is motivation, which includes participation in quality programs.
Training and education	Training (on-the-job, classroom, problem solving) and education are fundamental to achieving full commitment to quality.	To make quality happen, training should include the entire hierarchy, starting at the top: purpose of training is to create or update skills.
Teams	Quality control committees should have representatives from all functional areas.	Major quality improvement projects are multifunctional in nature, thus requiring multifunctional teams.
Culture	Quality control is a "spirit of quality mindedness," from CEO to the shop floor; it is a communication channel and means of participation.	Changing to a company-wide quality system means changing existing cultural patterns; there may well be cultural resistance.
	Deming (1982, 1986)	Ishikawa (1985)
	Customers define quality; consumers are the most important part of the production line.	Total quality control (TQC) means having a consumer orientation.
	Doing it right first time means less waste, less rework, and lower costs. Management's job is leadership (to show constancy of purpose in their focus on quality).	TQC reduces costs over the long term, not the short term.
	Crosby (1979, 1996)	
	Maturity grid: from goodness and delighting the customer to satisfaction and conformance.	
	The price of non-conformance means that quality is free.	
	Leadership by example—commitment is demonstrated by participation and attitude.	
	Use training in quality, from the CEO down, to internalize concepts; training and education should be continuous.	
	Use management team on quality for internal communication, quality councils for internal/external communication.	
	Quality commitment—genuine belief by employees in importance of good quality, workmanship, good designs, and service.	

management.² We therefore elected to exclude statistical process control as an area of agreement. Also, for example, Deming and Ishikawa spend time stressing the importance of a long-term focus, but for Crosby and Feigenbaum, the issue fades into the background, and Juran refers to it mainly in terms of preparing long-range quality programs. Feigenbaum, Ishikawa, and Juran all stress product design, but Crosby and Deming tend to focus their discussions elsewhere. With the exception of Crosby, all the authors pay substantial attention to planning, but their emphases are very different; where Juran covers all aspects of planning, Deming is mostly concerned with action planning, and Feigenbaum and Ishikawa concentrate on feedback and control. In the fifth of his 14 points, Deming argues for continuous process improvement in production and service, and the same idea is implicit in Crosby's 14th step which exhorts managers to ensure that the quality process never ends. Conversely, Feigenbaum and Ishikawa pay it scant attention, and Juran takes an alternate view by suggesting that there are eventual limits to the benefits to be gained from improvements to quality. Additionally, concepts like employee empowerment, which have almost become synonymous with TQM, are not explicitly discussed by most of the authors. While the idea of empowerment may arise from Feigenbaum's "individual responsibility," or Deming's suggestion that special causes of variation are the responsibility of operatives, it is only Juran (1995) who mentions empowerment, in passing, within his history of the quality movement. Acknowledging the differences among these authors' views should not detract from the fact that there is complete convergence in their views on the two main purposes (content) of quality management, and the four main activities (process) that are required to successfully implement the strategy.

3. Competitive advantage

There are two complementary models of competitive advantage, both of which are grounded in economic theory (see Conner, 1991; Porter, 1980, 1985). The first model—the market-based model—focuses on cost and differentiation and contends that the environment selects out firms that are inefficient or that do not offer products for which consumers are prepared to pay a premium price. This theory of advantage is mainly driven by external factors (opportunities, threats, and industry competition) and, as Porter (1985) points out, sustaining an advantage means presenting competitors with "a moving target." The second model centers on the firm's resources and is driven by factors that are internal to the firm. Idiosyncratic resources that provide operational superiority or help create a superior market position allow the firm to generate superior returns. In this resource-based theory model, sustainability of advantage relies upon competitors not being able to imitate resources.

² We tend to agree with Crosby (1996) who argues that it is the core concepts of quality management that are important to the success of TQM, and not activities like statistical process control, which relies on the use of statistical tools, control charts, and so forth. In the language of resource-based theory, and as we discuss later in the paper, such tools cannot be considered an inimitable resource because of the extensive documentation that exists for their use.

Resources include “assets, capabilities, organizational processes, firm attributes, information, and knowledge,” and can be classified in terms of physical, human, or organizational capital (Barney, 1991, p. 101).³ Human and organizational capital are viewed as being the main drivers of competitive advantage because, unlike physical capital, they are not as easily acquired in factor markets. Hansen and Wernerfelt (1989) found that organizational factors explained about twice as much variance in performance as economic factors, and Powell (1992) argues that the management skills used to align the organization with its environment are resources that can be sources of advantage. Hall (1992, 1993) points out that the “lasting and superior nature of intangible resources” (e.g., employee know-how, ability to manage change) are sources of sustainable advantage, and, in the same vein, Pfeffer (1994, 1995) identifies people, their skills, and the way they are managed as being important. Lado and Wilson (1994, p. 699) see human resource systems as important because they are “firm-specific, produce complex social relationships, are embedded in the firm’s history and culture, and generate tacit organizational knowledge.” Castanias and Helfat (1991) include cultural resources, organizational skills, and effective top management. Such resources are path-dependent and are developed over time (Collis, 1991; Mahoney, 1995; Williams, 1992).

Heterogeneity among firms’ human and organizational resources is at the heart of the resource-based view of competitive advantage. The firm with resources that are different from and superior to those of competitors have the ability to generate economic rents.⁴ In Barney’s (1991) terms, resources must be both rare and valuable, and if an advantage is to be sustained beyond the short term, the resources must also be imperfectly mobile (i.e., they cannot be easily obtained on the open market by competitors).⁵ These arguments assume that there are ex ante and ex post limits to competition for rents (Peteraf, 1993). The first assumption implies information asymmetry; otherwise, rents would be bid away by rivals who realized the true value of the resources. The second assumption presupposes the existence of barriers to imitation.

Although some differences exist among conceptualizations of barriers to imitation, there is also substantial overlap (Bharadwaj et al., 1993). For example, Dierickx and Cool (1989)

³ Within resource-based theory, opinions of what constitutes capabilities vary. For example, for Amit and Schoemaker (1993), capabilities arise from the development and exchange of information, and they are the means by which firms deploy resources. They also state that “[s]ome of the firm’s *Resources*, but especially its *Capabilities*, may be subject to market failure” (p. 35; emphasis is original). Alternatively, because capabilities are inseparable from the organizational and human capital of the firm, and because they have the same characteristics as resources, it can be argued that they are resources. This simpler view of capabilities is largely in line with Barney’s (1991) position on the subject, and it is the one we adopt here.

⁴ In resource-based theory, economic rents are typically Ricardian in nature (i.e., returns attributable to resource scarcity), but quasi-rents are also recognized (i.e., the difference in returns between the first and second best use of a resource). Peteraf (1993, p. 180, footnote 4) adds the explanation that “Earnings in excess of breakeven are called rents, rather than profits, if their existence does not induce new competition.”

⁵ Barney (1991) originally used four dimensions to describe resources: valuable, rare, imperfectly imitable, and non-substitutable. The first three dimensions are widely accepted within the resource-based view, but the fourth dimension has always been difficult to incorporate because of the tendency to view the theory against an equilibrium background. Consequently, non-substitutability has been quietly dropped from the mainstream arguments.

argue that idiosyncrasies in the way that firms accumulate resources make imitation difficult, and Coyne's (1985) "gaps" and Rumelt's (1984) "isolating mechanisms" revolve around the idea of maintaining asymmetries between firms' resources. The main area of overlap and the most-agreed-upon reason why imitation can be difficult is causal ambiguity between business inputs and outputs. Reed and DeFillippi (1990) argue that tacitness and complexity produce causal ambiguity and, thus, barriers to imitation.⁶ Tacitness is experience-based and arises from learning-by-doing. Complexity arises from the interrelationship among resources.

It has been argued that strategy content and process should be considered jointly (Barney & Zajac, 1994; Mahoney, 1995; Schendel, 1994). But, as can be deduced from Collis (1991), the market-based view of advantage most readily lends itself to the analysis of strategy content. Similarly, from Lado and Wilson (1994), it can be concluded that the resource-based view more readily lends itself to issues of strategy process. Therefore, in the following discussions, we use the market-based view as the main vehicle for considering the role that TQM can play in generating an advantage and the resource-based view for addressing the question of sustainability. In the case of the latter, our arguments also draw upon systems theory.

4. TQM content and competitive advantage

After considering the relationship between TQM and firm performance in a sample of U.S. firms, Powell (1995, p. 31) concluded that "The empirical results suggested that TQM can produce competitive advantage."⁷ But, he then questioned whether the vocabulary and tools of TQM are necessary for success, or whether the same outcome can be achieved by "developing the underlying intangible resources" (p. 31). Given that we perceive TQM as a strategy, and therefore much more than terminology and tools, we tend more to Gehani's (1993) view that TQM provides a unifying framework that brings a range of "good management practices" to bear simultaneously. The framework thus provides a context and direction for the development of the underlying intangible resources. So, the question still remains: Does TQM have the potential for generating a competitive advantage?

As already pointed out, there is agreement among Crosby, Deming, Feigenbaum, Ishikawa, and Juran that the purpose of quality management is to reduce costs and improve customer satisfaction. These ideas fit closely with the market-based view of competitive advantage

⁶ Reed and DeFillippi (1990) also argue that asset specificity creates barriers to imitation because firms can lock in customers. This view, which implies long-term relationships between parties and a limited impact from opportunism, is also to be found in the work of Bharadwaj et al. (1993), Dyer (1996) and others. But, because it remains a minority view, it is excluded from the discussion in this work. Similarly, time diseconomies (Dierickx & Cool, 1989), which are also considered to be sources of barriers to imitation, are excluded from our discussions because of their minority viewpoint status.

⁷ Competitive advantage per se was not operationalized in the study; the conclusion was drawn from the existence of superior firm performance. Thus, a more conservative interpretation of the findings, which would be in line with other studies (e.g., Hendricks & Singhal, 1997; Lemak et al., 1997), is that TQM produces superior performance.

arising from a superior cost structure or being able to differentiate products in a way that adds value for customers; i.e., the reduced rework and savings that emerge from improving product quality can help lower a firm's cost structure, and by producing products that better satisfy the requirements of customers, there is the potential for differentiation.

Beyond this obvious fit between the seminal literature and the market-based view, an examination of more recent work that deals specifically with TQM content helps provide validity. Reed et al. (1996) argued that TQM content includes four main components—generating a market advantage, enhancing product design efficiency, boosting product reliability, and increasing process efficiency—and they deduced that a fit is required among the orientation of the firm, the firm's environment, and the four main components of TQM to improve firm performance. For example, firms with a customer orientation operating in environments with high levels of uncertainty should focus on creating a market advantage and on product design efficiency to improve revenues and reduce costs, respectively. For firms with an operations orientation in an environment with low uncertainty, a concentration on product reliability and process efficiency will produce improved revenues and reduced costs, respectively. A market advantage arises from being market-driven (Day, 1990), which provides the potential for product differentiation through better identification of the needs of customers and the ability to anticipate competitors' product offerings. Likewise, firms that can offer products with a higher reliability than those offered by competitors are, in effect, differentiating their product offerings to customers.⁸ Better product design efficiency reduces costs by eliminating parts that do not add value which, in turn, makes products easier to produce. And, improved process efficiency, which arises from experience curve effects and learning, also reduces costs. We can therefore again conclude that TQM has the potential to generate competitive advantage. However, in this instance, the conclusion is sophisticated by the not unreasonable caveat that the creation of any advantage depends not only on TQM but also on the fit between the strategy, firm orientation, and the environment.

5. TQM process and sustainability of advantage

From resource-based theory, and as already pointed out, we know that tacitness resides within resources, but complexity is the result of interaction among resources. Therefore, in the following discussion, we examine the TQM process components of leadership and top management commitment, training and education, the use of teams, and culture in two ways. First, we consider them independently when exploring the potential for tacitness. Then, we consider them as a complete system when determining whether or not there is the potential for complexity from their interaction. Figure 1, which illustrates these two sets of relationships,

⁸ Hill (1988) argued that differentiation can be leveraged to increase market share — a point that fits closely with the conclusion in the seminal TQM literature that there are market share benefits to be gained from improved quality, and with the findings of numerous PIMS studies that considered the quality–share relationship (e.g., Buzzell & Gale, 1987; Buzzell et al., 1975; Buzzell & Wiersema, 1981a,b).

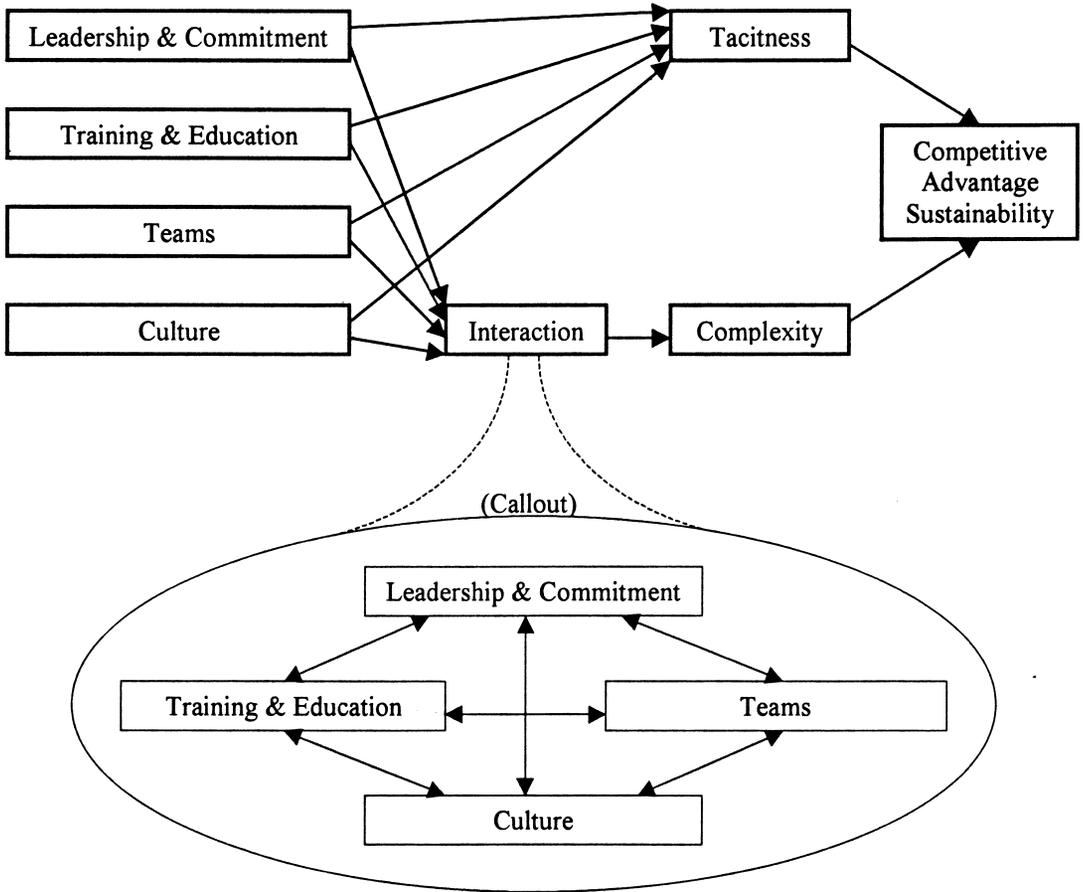


Fig. 1. TQM process activities, tacitness, complexity and sustainability of advantage.

includes a callout depicting the interaction among leadership and commitment, training and education, teams, and culture.

5.1. Tacitness

5.1.1. Leadership and top management commitment

In his book, *The Tacit Dimension*, Polanyi (1967) was one of the first to discuss the tacit nature of executive skills and their importance for firm success. More recently, Castanias and Helfat (1991) identified three basic types of managerial skill—generic, business- or industry-related, and firm-specific skills—that are rooted in innate abilities or learning and are a valuable intangible resource that is protected from imitation. Following the same reasoning, it has been argued that top management’s vision for the future can be a source of competitive advantage (Collins, 1991; Hamel & Prahalad, 1994; Schoemaker, 1992).

Puffer and McCarthy (1996) provide a framework for leadership in a TQM context and 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. Daft and Weick (1984) explored the question of vision creation and deduced that one of its determinants is the previous experience of the person creating the vision. Because experience is difficult to codify, it is not surprising that several resource-based theory scholars (e.g., Lado & Wilson, 1994) have pointed out that management's vision is inherently tacit in nature and is difficult to imitate. We can therefore conclude that leadership has the potential to create barriers to imitation. Throughout the extensive literature on leadership (e.g., Bass, 1985; Bass et al., 1987a,b; Burns, 1978; Podsakoff et al., 1996, 1990), the message that previous experience underpins transformational leadership remains consistent with Daft and Weick's view. However, it also suggests that transformation requires charismatic leaders (e.g., House et al., 1991). Charisma is highly tacit in nature.

The seminal TQM literature declares that commitment from top management is an important part of leadership, and it should be demonstrated with both directive and supportive behavior. We need to stress that what is being referred to here is *commitment by top management*, and not the organizational commitment discussed in much management research. Within the management literature, commitment by the individual is typically seen as having both affective and cognitive components. Interestingly though, discussions on commitment by top management are quite rare. Where it is mentioned, it is usually the affective state that is emphasized (e.g., Zaleznik, 1989), and this management research view of commitment is in line with thinking in sociology where a leader's commitment is also typically viewed as an emotion. Downton (1973), however, argued that commitment should not be viewed simply as an emotion because it arises from the tension created by the desire to satisfy a personal need, from the freedom and opportunity to take action, and from making investments and sacrifices that will ultimately produce a profit.⁹ Whether or not commitment is an emotion or arises from a personal need remains an open question and is not particularly relevant to this work. What is relevant is that both emotions and personal needs are wholly tacit in nature.

5.1.2. Employee training and education

Schonberger's (1992) conclusions on the role of training as a link between an organization's quality management strategy and its ability to create and maintain an advantage is likely valid but, unfortunately, he does not provide any clear statements on how training actually achieves this linkage. In the literature, however, there exists a well-established link between training and firm performance. For example, in a survey of high-performing organizations it was found that some 3.3% of payroll costs was dedicated to training compared to a recommended industry norm of only 1.5% (Kimmerling, 1993). Similarly, 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-technology

⁹ Downton's discussions are concerned with commitment in rebel leaders and how individuals decide to pursue one course of action over another. There are apparent parallels here with managers electing to adopt revolutionary quality strategies.

firms in their sample and, not surprisingly, research has also shown that training improves quality (Pfeffer, 1995).

In the seminal TQM literature, training is seen a vehicle for not only teaching the skills needed for producing quality products and services, but it is also a means of communicating a philosophy. Because philosophies are tacit in nature, we can conclude that training and education have the potential for generating barriers to imitation. Support for this argument can be found in empirical research that shows that training not only has behavioral and attitudinal influences (Burke & Day, 1986; Shani & Rogberg, 1994; Sommer & Merritt, 1994) but also has effects on awareness (Easton, 1993).

5.1.3. *Teams*

The management literature tells us that teams are appropriate when there is a need for the coordination of activities, where work needs to be creative, or where major breakthroughs in performance are required. Also, research has shown that in addition to providing an innovative approach to solving production problems, cross-functional teams also can help reduce product development times (Eisenhardt & Tabrizi, 1995).

It has been argued that team composition—the demographic and functional diversity of team members—affects performance and outcomes (Bettenhausen, 1991). When teams are composed of members with varying organizational perspectives, there should be better information available about potential future problems (Eisenhardt & Tabrizi, 1995; Gold, 1987; Imai et al., 1985). It has also been concluded that heterogeneity in teams is related to creativity and, ultimately, to decision-making effectiveness (Jackson et al., 1995, 1991), and Bantel and Jackson (1989) found that organizational innovations were positively associated with the increased functional heterogeneity of teams. The ability to generate better solutions to problems, creativity, better decision-making, and organizational innovation are all difficult (if not impossible) to codify. The literature implies that they emerge from the chemistry among team members which, if correct, represents a strong form of tacitness.

5.1.4. *Culture*

Culture is the values, beliefs, and norms that guide behavior in organizations. In line with this understanding, 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,” and where norms emerge as manifestations of these implicit assumptions. By making quality an assumption, the authors of the seminal TQM literature are effectively defining the norm for what is and is not acceptable behavior.

Since Barney (1986) argued that culture can be a valuable, rare, and imperfectly imitable resource, it seems reasonable to quickly conclude that culture can be a source of sustainable competitive advantage. However, there are additional arguments that can be made to give credibility to this conclusion. Fiol (1991) theorized that there is a missing link in the organization culture literature between the purists who focus on deep-level assumptions and the pragmatists who hone in on observable behaviors, reward systems, and the like. She argued that the missing link is between behaviors and their social meaning, and it is cognitive

processes (which are tacit in nature) that bring meaning to behaviors. Moreover, she contends that “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). The approach to culture change that is being advocated here departs from the traditional emphasis on changing behavior and then allowing values and beliefs to gradually change as the new behaviors become ingrained. Rather, what Fiol (1991) is arguing for is a cultural change within which employees are shown the entire context of the change (e.g., TQM becomes the central referent). Not only does this idea fit closely with the prescriptions advocated by the seminal authors on TQM, but so too does Fiol’s notion of “identity” which equates to their ideas of “genuine belief” and “philosophy.” Because cognitive processes, identities, beliefs, and philosophies are all tacit in nature, we can deduce that culture will help provide sustainability of a TQM-based advantage.

5.2. Complexity

Systems theory, which has already been applied to discussions of TQM (see, e.g., Waldman, 1994, who used a systems-based approach for examining work performance in TQM), also provides a vehicle for addressing the issue of complexity. TQM fits within the open systems view which, of course, recognizes that firms interact with their environment, and it aligns most closely with the rational systems perspective. This latter point is not surprising given that the rational systems approach (as opposed to natural systems approach) was the dominant organization management paradigm at the time when most of the seminal TQM literature was being written.

Scott (1992, p. 92) argued that the “open systems view stresses the complexity and variability of the individual parts [of the total system] ... as well as the looseness of connections between them,” whereby complexity arises from the number of system components and the interaction among them (Emery & Trist, 1965). Within the rational system perspective, and as exemplified by strategic contingency theory, that means that factors in the firm’s environment are the primary determinants of its actions and responses. Thus, in the case of TQM, firms’ actions are driven by the needs of customers and relationships with suppliers. At this high level of aggregation, where the firm is part of a broader system, the coupling is loose because actors can have divergent objectives, differing perceptions of the environment, and so forth. But, as the level of aggregation moves from the interorganizational institutional level to the intraorganizational managerial and technical levels, the coupling becomes tighter (Emery & Trist, 1965; Thompson, 1967). That shift in levels and change in coupling does not necessarily mean that complexity is diminished. Instead, it means that the focus of attention moves from the whole system to the subsystem and the interaction among its constituent parts.¹⁰ As Scott (1992) pointed out, the open systems view “shifts attention from structure to process,” and the emphasis thus moves from the organization to organizing. It is against this systems theory backdrop that we examine the

¹⁰ These arguments fit closely with those of resource-based theory which, as pointed out earlier, maintains that complexity, arising from resource interaction, creates causal ambiguity that produces barriers to imitation.

strength of the interactions among the process components of TQM (see the callout in Figure 1). The interactive nature of leadership, training, teams, and culture is clearly evident in management research, and it is to this literature that we now turn to illustrate the consequent complexity that exists.

Commonly held assumptions and values are at the heart of organization culture and thus provide the overall framework and context from which all other activities emanate (O'Reilly et al., 1991), including leadership. As Schein (1984, p. 3) stated: "Organizational culture is the pattern of basic assumptions that a given group has invented, discovered or developed in learning to cope with its problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and therefore, to be taught to new members as the correct way to perceive, think, and feel in relation to those problems." In Grant's (1996) terms, 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. And, that knowledge, which is disseminated throughout the organization at the direction of top management through education and training programs and within the socialization process that goes with activities such as the setting up of teams, provides cues for individuals to react to the problems.

In a study of 88 organizations, Kabanoff et al. (1995) identified four distinct cultures based on the value structure of the organization—elite, leadership, meritocratic and collegial. They used a list of nine values to develop their culture typology, among which was leadership and teamwork, and, consistent with the hypothesized typology, they found that each culture portrayed change quite differently, which suggests complex interactions between values like leadership and teamwork. O'Reilly et al. (1991) found empirical support for the notion that a fit between person and culture was crucial to such outcomes as employee commitment and tenure, but Sheridan (1992) called those results into question and suggested that the selection of employees with values consistent with the culture may not be as important as managers fostering the values in the culture that appeal to new employees. In this same vein of research, Lee et al. (1992) conducted a longitudinal study of retention rates of cadets at the U.S. Air Force Academy and discovered that differences between initial commitment rates of cadets dissipated over time. The observed attenuation was attributable to not only a rigorous socialization process but also the continuing strong emphasis on leadership, teamwork, and training.

Beyond managerial and financial commitment to training and education, training effectiveness has been shown to rely on and affect other factors; e.g., training affects behavior and attitudes (Burke & Day, 1986; Shani & Rogberg, 1994; Sommer & Merritt, 1994). Roberts (1997) argues that teams are the vehicles for carrying out training, and a 1997 survey of American organizations found that 75% of organizations used training for team building and leadership development and 63% for quality improvement (Training, 1997). It was hypothesized by Tracey et al. (1995) that an organization's climate and culture were directly related to post-training behaviors. From their survey of 550 supermarket managers, they found support for that contention and concluded that the organization's social system was a strong contributor to the success of training interventions. Birdi et al. (1997) studied a variety of organizational and environmental

factors that influence training activity and found that management support contributed to some types of development activity. They also pointed to the complexity of the relationship among organizational environmental factors as elements of the “continuous learning culture” in organizations.

The existence of the group is central to Schein’s (1984) definition of culture. As he points out, culture is embedded in the group and not the other way around. The interaction between culture and teams depends upon how the team approach is implemented. On the one hand, some firms have developed cultures that are consistent with the Japanese model that stresses the group over individual achievement, standardization of work processes, and a more hierarchical structure. On the other hand, there is the European, socio-technical systems model that relies more on empowerment, flexibility, and innovation through self-managed teams for the improvement of quality (Cardy & Stewart, 1998). At a more micro level of implementation, Cohen and Bailey (1997) developed a model of the factors that contribute to team effectiveness. They drew from extensive research that found that team effectiveness is a function of group design characteristics, which includes internal and external leadership (internal and external to the team) and group composition factors (diversity, tenure, size). Manz and Sims (1987) studied leader behaviors for self-managing teams and found that the behaviors could be described in terms of rehearsing (training), goal setting (leadership), evaluation (leadership), and self-reinforcement (culture and the development of high expectations). Thus, factors unique to the organizational context influence team effectiveness, and each is a function of leadership in the sense that their consideration is important when assembling teams.

In line with Bettenhausen (1991) and Denison et al. (1996), Cohen and Bailey’s (1997) model also suggests that other organizational contextual factors, such as commitment to teams, norms, group skills, and more combine to contribute to group effectiveness. These factors, which are internal to the organization, are also influenced by environmental factors such as industry characteristics and market turbulence (Cohen & Bailey, 1997). Perception of those external factors is a function of a culture that partially defines how an organization views itself within an industry context—who are we, where are we going, and what is the best way of getting there—and, together, they provide the framework within which the group operates. They contribute directly and indirectly to group effectiveness, not in bivariate ways but in more complex ways. For example, in some teams, autonomy is associated with higher performance but, in others, the relationship can be negative, and higher-performing teams can be those where management retains more control (Cohen & Bailey, 1997). However, autonomy has a positive effect on performance when organization climate, which is a function of leadership and culture, supports innovation (Kim & Lee, 1995).

In summary, the theoretical and empirical literatures on leadership, education and training, teams, and culture provide strong support for the notion that these activities combine in numerous ways and are difficult to separate. In other words, the causal links among leadership, training, teams, and culture are multidirectional. In Venkatraman’s (1989) terms, the fit that exists between them is a gestalt. In gestalts, the combination of attributes is holistic in nature and (under conditions that permit variation) there is some

potential equifinality.¹¹ Also, as Venkatraman's points out, "if the system [gestalt] were decomposed into a set of bivariate contingencies, it is plausible that internal inconsistencies . . . would exist" (p. 432). Thus, when viewed as a system supporting TQM, leadership, training, teams, and culture must be seen as a whole rather a collection of separate parts. And, as a whole system, it embodies the complexity that generate barriers to imitation and consequent sustainability of advantage.

6. Discussion and implications

The main intent of this paper was to explore the relationship between TQM and competitive advantage and to determine, from a theoretical perspective, whether the claims in the TQM literature that the strategy can produce a sustainable advantage are justified. After an analysis of the seminal TQM literature, we provided arguments that show how the strategy content of TQM can generate a cost- or differentiation-based advantage. Using concepts from resource-based theory and systems theory, we then showed how the process of TQM has the potential to create sustainability of advantage. The individual components of the strategy's process embody tacitness and are a complex system, thus producing the causal ambiguity that can protect a TQM-based advantage from imitation.

We have not generated any propositions for translation into hypotheses for empirical testing because, as just pointed out above, that was not the intent of the work. However, in the process of providing a theoretical rationale for the relationship between TQM and sustainable advantage, several issues worthy of further research consideration have emerged. There are also some points that are worth noting for practice and the implementation of TQM.

6.1. Implications for research

Most obviously, there is a need to empirically validate the theory presented here on TQM content and competitive advantage. The research by Powell (1995), Flynn et al. (1995) and others suggests that such a relationship may exist.¹² But to be more conclusive, there is a need for a finer-grained approach to testing the arguments that TQM can generate a cost- and/or differentiation-based advantage. There is also a need for empirical work to address the issue of the sustainability of a TQM-based advantage.

There is no published empirical research on sustainability. The reason is probably due to problems of operationalization. Barney's (1991) definition of sustainability—when competitors cease attempts to imitate—is a strong form of sustainability. Although the definition has conceptual clarity and theoretical appeal because of its unequivocality, it is not particularly user-friendly for the empiricist. Unfortunately, neither is softer form. It has been argued that the ability of competitors to imitate an advantage depends upon

¹¹ The parallel that can be drawn here with systems theory arguments on synergy and equifinality is apparent and does not need further elaboration.

¹² Other works, such as that by Kroll et al. (1999), which look at the relationship between product quality and variance in returns, also imply that a relationship exists between quality and competitive advantage.

both the height of the barriers to imitation (i.e., the amount of tacitness and complexity) and the competitiveness of the industry (Reed & DeFillippi, 1990). Under this rubric, sustainability is not an absolute condition that readily lends itself large, cross-sectional studies. Also, if we assume that there are diminishing returns to continued investment in the sources of advantage, then, while competitors may never be able to completely imitate an advantage, the difference between rivals may become so small as to be moot. Given these difficulties of operationalization, the question must be asked whether or not it is worth the effort. Given the centrality of competitive advantage to business level strategies, and the consequent importance with which it has been imbued by academics and managers alike, the answer must be yes.

Our arguments suggest that the TQM process is best viewed as a gestalt. Consequently, we need to move beyond the simpler bivariate analyses that currently dominate empirical work on TQM. Unfortunately, working with gestalts is more difficult. But, since Miller (1986, 1987) lobbied for the use of configurational research in management, developments in statistical tools have made the task somewhat less daunting.

6.2. Implications for practice

It was pointed out in the Economist (1992) that three-fourths of U.S. and British firms were using some form of quality management program, but that the expected performance often was not being realized. Yet, as pointed out in Section 1, empirical research clearly shows a link between the use of TQM and improved firm performance. This message may have been lost on some firms, particularly those with a pressure on managers to use strategies that show immediate results. But, even as some firms abandon TQM, and some academics lose interest in the subject (Heady et al., 1997), firms like AlliedSignal, Du Pont, and GE have committed to having quality management programs for the long term (Hunter & Schmitt, 1999).¹³ Why? Because they have discovered for themselves that there is a relationship between quality management and performance. For example, Hunter and Schmitt reported that, in 1998, quality practices contributed an additional US\$500 million to AlliedSignal's profits, and it is anticipated that they will contribute some US\$625 million in 1999. Also, for example, in their 1997 annual report, GE's management team explained that their quality initiative, which was adopted in 1995 and modeled on the program "pioneered" by Motorola and "embraced" by AlliedSignal, had improved the firm's operating margin from 10% to more than 15% (General Electric, 1998). Thus, the first implication for practice is that quality management does improve performance. Firms that jumped on and then off the TQM bandwagon may want to reconsider the strategy.

¹³ These companies use "Six Sigma" quality programs which, according to the Director of the Center for Excellence Six Sigma Quality at PricewaterhouseCoopers, have substantial overlap with TQM (see comments in Hunter & Schmitt, 1999). Also see GE's 1997 Annual Report for a discussion on emphasis that the company puts on leadership, training, teams, culture, and their interaction in the implementation of their Six Sigma program, which confirms the PricewaterhouseCoopers' view. Six Sigma may therefore simply be viewed as a variant of TQM.

Whether or not those performance increases are derived from a quality-based competitive advantage is not as easy to answer. A circular argument can be made that the performance gains of companies using quality management practices such as TQM lend credence to the conclusion that there is a link with competitive advantage, but, more convincingly, some managers, such as those at GE Plastics (Bouchard, 1998) and Stanley Engineered Components (Roethlein & Mangiameli, 1999), perceive a real link between the management of quality and competitive advantage. Also, where empirical research has attempted the difficult task of tapping into the relationship between quality management practices and competitive advantage, some support has been found (e.g., Flynn et al., 1995; Ismail et al., 1998).

The second implication of this work for practice revolves around the fact that TQM is not easy. Embedded within the process of TQM is the need for commitment to the strategy by top management. That commitment means leading by example, providing training and education, and supporting a culture in which teams can flourish. As our arguments suggest, the TQM process is a system with interactive components, and committing to just one part of the system is unlikely to produce the desired effects. Thus, TQM is more than leadership, it is more than culture, or training, or teams. It is all of them together, and successful implementation means that effort and perseverance are required to find the right balance for each organization. Because of the inherent tacitness and complexity and consequent causal ambiguity, attempted imitation of what other firms do is probably a pointless exercise. As theory suggests, there is the potential for equifinality and it therefore behooves each firm to explore its own needs for leadership, education and training, the use of teams, and culture development to fit its own particular brand of TQM. It should be remembered that if TQM were easy to do, then all firms would do it. But then, of course, by definition, the strategy would not be able to generate a sustainable competitive advantage.

References

- Amit, R., & Schoemaker, P. J. H. (1993). Strategic assets and organizational rent. *Strategic Management Journal*, 14, 33–46.
- Bantel, K. A., & Jackson, S. E. (1989). Top management and innovations in banking: does composition of the top teams make a difference? *Strategic Management Journal*, 10, 107–124.
- Barney, J. B. (1986). Organization culture: can it be a source of sustained competitive advantage? *Academy of Management Review*, 11, 656–665.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17, 99–120.
- Barney, J. B., & Zajac, E. J. (1994). Competitive organizational behavior: toward an organizationally based theory of competitive advantage. *Strategic Management Journal*, 15 (Winter), 5–9.
- Bass, B. M. (1985). *Leadership and performance beyond expectation*. New York: Free Press.
- Bass, B. M., Avolio, B. J., & Goodheim, L. (1987). Biography and the assessment of transformational leadership at the world-class level. *Journal of Management*, 13, 7–19.
- Bass, B. M., Waldman, D. A., Avolio, B. J., & Bebb, M. (1987). Transformational leadership and the falling dominoes effect. *Group and Organization Studies*, 12, 73–87.
- Bettenhausen, K. L. (1991). Five years of groups research: what have we learned and what needs to be addressed. *Journal of Management*, 17, 345–381.

- Bharadwaj, S. G., Varadarajan, P. R., & Fahy, J. (1993). Sustainable competitive advantage in service industries: a conceptual model and research propositions. *Journal of Marketing*, 57 (4), 83–99.
- Birdi, K., Allan, C., & Warr, P. (1997). Correlates and perceived outcomes of four types of employee development activity. *Journal of Applied Psychology*, 82, 845–857.
- Bouchard, T. J. (1998). Technology, cost reduction, global service, and quality: keys to a competitive advantage in today's automotive market. *Design*, June 22, S11–S13.
- Brown, W. B., & Karagozolu, N. (1993). Leading the way to faster new product development. *The Academy of Management Executive*, 7 (1), 36–47.
- Burke, M. J., & Day, R. R. (1986). A cumulative study of the effectiveness of managerial training. *Journal of Applied Psychology*, 71, 232–245.
- Burns, J. M. (1978). *Leadership*. New York: Harper and Row.
- Buzzell, R. D., & Gale, B. T. (1987). *The PIMS principles: linking strategy to performance*. New York: Free Press.
- Buzzell, R. D., Gale, B. T., & Sultan, R. G. M. (1975). Market share—a key to profitability. *Harvard Business Review*, 53 (1), 97–106.
- Buzzell, R. D., & Wiersema, F. D. (1981a). Successful share-building strategies. *Harvard Business Review*, 59 (1), 135–144.
- Buzzell, R. D., & Wiersema, F. D. (1981b). Modelling changes in market share: a cross-sectional analysis. *Strategic Management Journal*, 2, 27–42.
- Cardy, R. L., & Dobbins, G. H. (1996). Human resource management in a total quality organizational environment: shifting from a traditional to a TQHRM approach. *Journal of Quality Management*, 1, 5–20.
- Cardy, R. L., & Stewart, G. L. (1998). Quality and teams: implications for HRM theory and research. In D. B. Fedor & S. Ghosh (Eds.), *Advances in the management of organizational quality* (pp. 89–120). Stamford, CT: JAI Press.
- Castanias, R. P., & Helfat, C. E. (1991). Managerial resources and rents. *Journal of Management*, 17, 155–171.
- Cohen, S. G., & Bailey, D. E. (1997). What makes teams work: group effectiveness research from the shop floor to the executive suite. *Journal of Management*, 23, 239–290.
- Collins, J. C. (1991). Organizational vision and visionary organizations. *California Management Review*, 34 (1), 30–52.
- Collis, D. J. (1991). A resource-based analysis of global competition: the case of the bearings industry. *Strategic Management Journal*, 12 (Summer), 49–68.
- Conner, K. R. (1991). A historical comparison of resource-based theory and five schools of thought within industrial organization economics: do we have a new theory of the firm. *Journal of Management*, 17, 121–151.
- Coyne, K. P. (1985). Sustainable competitive advantage—what it is, what it isn't. *Business Horizons*, 29 (1), 54–61.
- Crosby, P. B. (1979). *Quality is free: the art of making quality certain*. New York: McGraw-Hill.
- Crosby, P. B. (1996). *Quality is still free: making quality certain in uncertain times*. New York: McGraw-Hill.
- Curkovic, S., & Pagell, M. (1999). A critical evaluation of the ability of ISO 9000 to lead to a competitive advantage. *Journal of Quality Management*, 4, 51–67.
- Cyert, R. M. (1993). Universities, competitiveness and TQM: a plan of action for the year 2000. *Public Administration Quarterly*, 17 (1), 10–18.
- Daft, R. L., & Weick, K. E. (1984). Toward a model of organization as a model of interpretation systems. *Academy of Management Review*, 2, 284–295.
- Day, G. S. (1990). *Market-driven strategy: processes for creating value*. New York: Free Press.
- Dean Jr., J. W., & Bowen, D. E. (1994). Management theory and total quality: improving research and practice through theory development. *Academy of Management Review*, 19, 392–418.
- Deming, W. E. (1982). *Quality, productivity, and competitive position*. Cambridge, MA: Massachusetts Institute of Technology, Center for Advanced Engineering Study.

- Deming, W. E. (1986). *Out of the crisis*. Cambridge, MA: Massachusetts Institute of Technology, Center for Advanced Engineering Study.
- Denison, D. R., Hart, S. L., & Kahn, J. A. (1996). From chimneys to cross-functional teams: developing and validating a diagnostic model. *Academy of Management Journal*, 39, 1005–10023.
- Dierickx, I., & Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35, 1504–1511.
- Downton, J. V. (1973). *Rebel leadership: commitment and charisma in the revolutionary process*. New York: Free Press.
- Dyer, J. H. (1996). Does governance matter: Keiretsu alliances and asset specificity as sources of Japanese competitive advantage. *Organization Science*, 7, 649–666.
- Easton, G. S. (1993). The 1993 state of U.S. total quality management: a Baldrige examiner's perspective. *California Management Review*, 35 (3), 32–54.
- Easton, G. S., & Jarrell, S. L. (1998). The effects of total quality management on corporate performance: an empirical investigation. *Journal of Business*, 71, 253–307.
- Economist (Anonymous) (1992). *The cracks in quality* (Vol. 18). 67–68 April.
- Eisenhardt, K. M., & Tabrizi, B. N. (1995). Accelerating adaptive processes: product innovation in the global computer industry. *Administrative Science Quarterly*, 40, 84–110.
- Emery, F. E., & Trist, E. L. (1965). The causal texture of organizational environments. *Human Relations*, 18, 21–32.
- Feigenbaum, A. V. (1951). *Quality control: principles, practice, and administration*. New York: McGraw-Hill.
- Feigenbaum, A. V. (1961). *Quality control* (2nd ed.). New York: McGraw-Hill.
- Feigenbaum, A. V. (1983). *Quality control* (3rd ed.). New York: McGraw-Hill.
- Feigenbaum, A. V. (1990). Management of quality: the key to the nineties. *Journal for Quality and Participation*, 13 (2), 14–19.
- Feigenbaum, A. V. (1991). *Total quality control* (40th anniversary ed.: 3rd ed., revised). New York: McGraw-Hill.
- Feigenbaum, A. V. (1992). Quality: our new competitive edge. *Executive Excellence*, 9 (5), 18–19.
- Fiol, C. M. (1991). Managing culture as a competitive resource: an identity-based view of sustainable competitive advantage. *Journal of Management*, 17, 191–211.
- Flynn, B. B., Schroeder, R. G., & Sakakibara, S. (1995). The impact of quality management practices on performance and competitive advantage. *Decision Sciences*, 26, 659–691.
- Gehani, R. R. (1993). Quality value chain: a meta synthesis of frontiers of quality movement. *Academy of Management Executive*, 7 (2), 29–42.
- General Electric (1998). *1997 Annual report*. Fairfield, CT: GE.
- Gold, B. (1987). Approaches to accelerating product and process development. *Journal of Product Innovation Management*, 4, 81–88.
- Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17 (Winter), 109–122.
- Hall, R. (1992). The strategic analysis of intangible resources. *Strategic Management Journal*, 13, 135–144.
- Hall, R. (1993). A framework linking intangible resources and capabilities to sustainable competitive advantage. *Strategic Management Journal*, 14, 607–618.
- Hamel, G., & Prahalad, C. K. (1994). *Competing for the future*. Boston, MA: Harvard Business School Press.
- Hansen, G. S., & Wernerfelt, B. (1989). Determinants of firm performance: the relative importance of organizational and economic factors. *Strategic Management Journal*, 10, 399–411.
- Harber, D., Burgess, K., & Barclay, D. (1993). Total quality management as a cultural intervention: an empirical study. *The International Journal of Quality and Reliability Management*, 10 (6), 28–46.
- Heady, R. B., Smith, M., Robert, L. P., & Logan, G. T. (1997). Leadership in authoring the quality management literature. *Journal of Quality Management*, 2, 139–149.
- Hendricks, C. F., & Triplett, A. (1989). TQM: strategy for '90s management. *Personnel Administrator*, 34 (12), 42–48.
- Hendricks, K. B., & Singhal, V. R. (1997). The long-term stock price performance of quality award winners.

- In D. B. Fedor & S. Ghosh (Eds.), *Advances in the management of organizational quality* (pp. 1–37). Greenwich, CT: JAI Press.
- Hewitt, S. (1994). Strategic advantages emerge from tactical TQM tools. *Quality Progress*, 27 (10), 57–59.
- Hill, C. W. L. (1988). Differentiation versus low cost or differentiation and low cost: a contingency framework. *Academy of Management Review*, 13, 401–412.
- House, R. J., Spangler, W. D., & Woycke, J. (1991). Personality and charisma in the U.S. presidency: a psychological theory of leadership effectiveness. *Administrative Science Quarterly*, 36, 364–396.
- Hunter, D., & Schmitt, B. (1999). Six sigma: benefits and approaches. *Chemical Week*, 161 (37), 35–36.
- Imai, K., Ikujiro, N., & Takeuchi, H. (1985). Managing new product development process: how Japanese companies learn and unlearn. In R. H. Hayes, K. B. Clark, & C. Lorenz (Eds.), *The uneasy alliance: managing the productivity technology dilemma* (pp. 307–373). Boston, MA: Harvard Business School Press.
- Ishikawa, K. (Translated by D. J. Lu) (1985). *What is total quality control? The Japanese way*. Englewood Cliffs, NJ: Prentice-Hall.
- Ismail, M. Y., Baradie, M. El., & Hashmi, M. (1998). Quality management in the manufacturing industry: practice vs. performance. *Computers and Industrial Engineering*, 35, 519–522.
- Jackson, S. E., May, K. E., & Whitney, K. (1995). Understanding the dynamics of diversity in decision-making environments. In R. A. Guzzo & E. Salas (Eds.), *Team effectiveness and decision-making in organizations* (pp. 204–261). San Francisco, CA: Jossey Bass.
- Jackson, S. F., Brett, J. F., Sessa, V. I., Cooper, D. M., Julin, J. A., & Peyronnin, K. (1991). Some differences make a difference: individual dissimilarity and group heterogeneity as correlates of recruitment, promotion and turnover. *Journal of Applied Psychology*, 76, 675–689.
- Jenner, R. A., Hebert, L., Appell, A., & Baack, J. (1998). Using quality management for cultural transformation of Chinese state enterprises: a case study. *Journal of Quality Management*, 3, 193–210.
- Juran, J. M. (1951). *Quality control handbook*. New York: McGraw-Hill.
- Juran, J. M. (1962). *Quality control handbook* (2nd ed.). New York: McGraw-Hill.
- Juran, J. M. (1974). *Quality control handbook* (3rd ed.). New York: McGraw-Hill.
- Juran, J. M. (1988). *Juran on planning for quality*. New York: Free Press.
- Juran, J. M. (1989). *Juran on leadership for quality: an executive handbook*. New York: Free Press.
- Juran, J. M. (1992). *Juran on quality by design: the new steps for planning quality into goods and services*. New York: Free Press.
- Juran, J. M. (1995). *A history of managing for quality: the evolution, trends, and future direction of managing for quality*. Milwaukee, WI: ASQC Quality Press.
- Kabanoff, B., Waldersee, R., & Cohen, M. (1995). Espoused values and organizational change themes. *Academy of Management Journal*, 4, 1075–1104.
- Kim, Y., & Lee, B. (1995). R&D project team climate and team performance in Korea: a multidimensional approach. *R&D Management*, 25, 179–196.
- Kimmerling, G. (1993). Gathering best practices. *Training and Development*, 47 (9), 38–47.
- Kroll, M., Wright, P., & Heiens, R. A. (1999). The contribution of product quality to competitive advantage: impacts on systematic variance and unexplained variance in returns. *Strategic Management Journal*, 20, 375–384.
- Lado, A. A., & Wilson, M. C. (1994). Human resource systems and sustained competitive advantage: a competency-based perspective. *Academy of Management Review*, 19, 699–727.
- Lee, T. W., Ashford, S. J., Walsh, J. P., & Mowday, R. T. (1992). Commitment propensity, organizational commitment and voluntary turnover: a longitudinal study of organizational entry processes. *Journal of Management*, 18, 15–32.
- Lemak, D. J., Reed, R., & Satish, P. K. (1997). Commitment to total quality management: is there a relationship with firm performance? *Journal of Quality Management*, 2, 67–86.
- Mahoney, J. T. (1995). The management of resources and the resource of management. *Journal of Business Research*, 33, 91–101.
- Manley, J. E. (1998). Symbol, ritual and doctrine: the cultural ‘tool kit’ of TQM. *Journal of Quality Management*, 3, 175–191.

- Manz, C. C., & Sims, H. P. (1987). Leaders working to lead themselves: the external leadership of self-managing work teams. *Administrative Science Quarterly*, 32, 106–128.
- Miller, D. (1986). Configurations of strategy and structure: towards a synthesis. *Strategic Management Journal*, 7, 233–249.
- Miller, D. (1987). The structural and environmental correlates of business strategy. *Strategic Management Journal*, 8, 55–76.
- Noori, H. (1991). TQM and its building blocks: learning from world-class organizations. *Optimum* 22 (3), 31–38.
- O'Reilly III, C. A., Chatman, J., & Caldwell, D. F. (1991). People and organizational culture: a profile comparison approach to assessing person–organization fit. *Academy of Management Journal*, 34, 487–516.
- Peteraf, M. A. (1993). The cornerstones of competitive advantage: a resource-based view. *Strategic Management Journal*, 14, 179–191.
- Pfeffer, J. (1994). Competitive advantage through people. *California Management Review*, 36 (2), 9–28.
- Pfeffer, J. (1995). Producing sustainable competitive advantage through the effective management of people. *Academy of Management Executive*, 9 (1), 55–69.
- Podsakoff, P. M., MacKenzie, S. B., & Bommer, W. H. (1996). Transformational leader behaviors and substitutes for leadership as determinants of employee satisfaction, commitment, trust and organizational citizen behavior. *Journal of Management*, 22, 259–298.
- Podsakoff, P. M., MacKenzie, S. B., Moorman, R. H., & Fetter, R. (1990). Transformational leader behaviors and their effects on followers' trust in leader, satisfaction and organization citizenship behaviors. *Leadership Quarterly*, 1, 107–142.
- Polanyi, M. (1967). *The tacit dimension*. Garden City, NY: Anchor.
- Porter, M. E. (1980). *Competitive strategy: techniques for analyzing industries and competitors*. New York: Free Press.
- Porter, M. E. (1985). *Competitive advantage: creating and sustaining superior performance*. New York: Free Press.
- Powell, T. C. (1992). Organizational alignment as competitive advantage. *Strategic Management Journal*, 13, 119–134.
- Powell, T. C. (1995). Total quality management as competitive advantage: a review and empirical study. *Strategic Management Journal*, 16, 15–37.
- Puffer, S. M., & McCarthy, D. J. (1996). A framework for leadership in a TQM context. *Journal of Quality Management*, 1, 109–130.
- Reed, R., & DeFillippi, R. J. (1990). Causal ambiguity, barriers to imitation and sustainable competitive advantage. *Academy of Management Review*, 15, 88–102.
- Reed, R., Lemak, D. J., & Montgomery, J. C. (1996). Beyond process: TQM content and firm performance. *Academy of Management Review*, 21, 173–202.
- Reger, R. K., Gustafson, L. T., DeMarie, S. M., & Mullane, J. V. (1994). Reframing the organization: why implementing total quality is easier said than done. *Academy of Management Review*, 19, 565–584.
- Reich, R. (1994). Leadership and the high performance organization. *Journal for Quality and Participation*, 17 (2), 6–11.
- Roberts, E. (1997). Team training: when is enough . . . enough? *The Journal of Quality and Participation* 20 (3), 16–20.
- Roethlein, C. J., & Mangiameli, P. M. (1999). The realities of becoming a long-term supplier to a large TQM customer. *Interfaces*, 29 (4), 71–81.
- Rumelt, R. P. (1984). Towards a strategic theory of the firm. In R. B. Lamb (Ed.), *Competitive strategic management* (pp. 556–570). Englewood Cliffs, NJ: Prentice-Hall.
- Samson, D., & Terziovski, M. (1999). The relationship between total quality management practices and operational performance. *Journal of Operations Management*, 17, 393–409.
- Schein, E. H. (1984). Coming to a new awareness of organizational culture. *Sloan Management Review*, 25 (2), 3–16.
- Schein, E. H. (1996). Culture: the missing concept in organization studies. *Administrative Science Quarterly*, 41, 229–240.

- Schendel, D. (1994). Introduction to competitive organizational behavior: toward an organizationally based theory of competitive advantage. *Strategic Management Journal*, 15 (Winter), 1–4.
- Schoemaker, P. J. H. (1992). How to link strategic vision to core capabilities. *Sloan Management Review*, 34 (1), 67–81.
- Schonberger, R. (1992). Total quality management cuts a broad swath through manufacturing and beyond. *Organizational Dynamics*, 20 (4), 16–28.
- Scott, W. R. (1992). *Organizations: rational, natural and open systems* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.
- Seawright, K. W., & Young, S. T. (1996). A quality definition continuum. *Interfaces*, 26 (3), 107–113.
- Shani, A. B., & Rogberg, M. (1994). Quality, strategy and structural configuration. *Journal of Organizational Change Management*, 7 (2), 15–30.
- Shea, C. M., & Howell, J. M. (1998). Organizational antecedents to the successful implementation of total quality management: a social cognitive perspective. *Journal of Quality Management*, 3, 3–24.
- Sheridan, J. E. (1992). Organizational culture and employee retention. *Academy of Management Journal*, 35, 1036–1056.
- Shetty, Y. K. (1993). The quest for quality excellence: lessons from the Malcolm Baldrige Quality Award. *SAM Advanced Management Journal*, 58 (2), 34–40.
- Sitkin, S. B., Sutcliffe, K. M., & Schroeder, R. G. (1994). Distinguishing control from learning in total quality management: a contingency perspective. *Academy of Management Review*, 19, 537–564.
- Sommer, S. M., & Merritt, D. E. (1994). The impact of a TQM intervention on workplace attitudes in a health care organization. *Journal of Organizational Change Management*, 7 (2), 53–62.
- Spencer, B. A. (1994). Models of organization and total quality management: a comparison and critical evaluation. *Academy of Management Review*, 19, 446–471.
- Spitzer, R. D. (1993). TQM: the only source of competitive advantage. *Quality Progress*, 26 (6), 59–64.
- Thompson, J. D. (1967). *Organizations in action*. New York: McGraw-Hill.
- Tilton, H. (1994). Quality '94: offering the best. *Chemical Marketing Reporter*, 246 (18), SR3–SR6.
- Tobin, L. M. (1990). The new quality landscape: total quality management. *Journal of Systems Management*, 41 (11), 10–14.
- Tracey, J. B., Tannenbaum, S. I., & Kavanaugh, M. J. (1995). Applying trained skills on the job: the importance of the work environment. *Journal of Applied Psychology*, 80, 239–252.
- Training (Anonymous) (1997). *1997 Industry report* (pp. 33–72) October.
- Venkatraman, N. (1989). The concept of fit in strategy research: toward verbal and statistical correspondence. *Academy of Management Review*, 14, 423–444.
- Waldman, D. A. (1994). The contributions of total quality management to a theory of work performance. *Academy of Management Review*, 19, 510–536.
- Williams, J. R. (1992). How sustainable is your competitive advantage? *California Management Review*, 34 (3), 29–51.
- Zaleznik, A. (1989). *The managerial mystique: restoring leadership in business*. New York: Harper and Row.