Environmental Uncertainty, Strategic Orientation, and Quality Management: A Contingency Model

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Although quality management practices have been implemented by many organizations all over the world, such implementations have often failed. This failure rate is largely attributed to the lack of integration between quality management practices, business strategy, and environmental uncertainty. This article proposes a contingency model relating quality approach, strategic orientation, and environmental uncertainty. The three quality approaches addressed in this model are quality assurance, total quality management, and total quality learning. The Miles and Snow model is used as the strategic orientation typology.

This proposed contingency model posits that to maximize organizational effectiveness, quality approaches need to be congruent with a particular strategic orientation and a particular level of environmental uncertainty. It proposes that quality assurance should be matched with the "defender" strategic orientation in environments characterized with low uncertainty. Total quality management is proposed to be aligned with "analyzers" in environments of moderate uncertainty. Finally, it is proposed that total quality learning be matched with "prospectors" and high environmental uncertainty.

Key words: assurance, contingency, environmental uncertainty, learning, quality management, strategic orientation

INTRODUCTION

In a world of increased competitiveness and demanding customers who expect to have the highest quality products at the lowest possible prices, quality is widely recognized as a source of competitive advantage and is increasingly elevated to strategic importance as an essential determinant of success. Hence, the relationship between quality management and strategy is of great interest to researchers and practitioners alike. Work in this area is gaining momentum, and relationships are being investigated from different angles.

Many studies have reported a high rate of quality implementation failures (Spector and Beer 1994; Eskildson 1994). Causes for these failures include cultural barriers and lack of top management commitment (Ngai and Cheng 1997). These barriers have been sufficiently addressed in the literature (Choi and Behling 1997; Ahire and O'Shaughnessy 1998; Puffer and McCarthy 1996; Zeitz, Johannasson, and Ritchell 1997; Jabnoun 2001). Reed, Lemak, and Montgomery (1996) attribute this failure rate to the fact that the match between environmental uncertainty, firm orientation, and total quality management (TQM) was not properly addressed. They generally focus on the content of TQM in relation to firm orientation (internal focus/customer focus) and performance in the context of environmental uncertainty. They relate uncertainty to firm orientation and propose that attention to customers is paramount when uncertainty is high, and a focus on operations is more beneficial when uncertainty is low. They consider that market-driven strategies and value engineering are consistent with customer orientation,

while continuous improvement and enhancing product reliability are "operation" (internal) oriented. Finally, they conclude that a mismatch between environmental uncertainty and firm orientation reduces revenues and/or increases cost.

Reed, Lemak, and Montgomery's (1996) study, however, did not look at different quality management approaches and how they relate to specific strategic orientations in the context of environmental uncertainty. Their approach instead looked into the content of TQM (but not other quality approaches) in relation to both internal and external orientations (but not specific strategies or strategic orientations) of the firm as well as its performance at different levels of environmental uncertainty.

Moreno-Luzón and Peris (1998) developed an elaborate contingency model relating quality management approaches to three important organizational dimensions: contingency factors, the company's strategic management, and basic variables of organizational design. The basic organizational design variables of the contingency model are: level of decision-making centralization, level of formalization-standardization, and levels of shared values in the firm. Both internal and external contingency factors are incorporated in the model. These factors include: size, technical system, and dynamism and complexity of the environment. The strategic management approaches encompass entrepreneurial school, design school, strategic planning school, learning school, and strategic architecture. Moreno-Luzón and Peris fit in their model two major quality management approaches: quality assurance (QA) and TQM. They concluded among other things that there is proximity of TQM to strategic architecture, emergent strategy, and umbrella strategy; on the other hand, QA is more closely related to the traditional version of strategic planning and strategic design. Moreno-Luzón and Peris' model, however, considered strategic management approaches in very broad terms in the context of a process rather than its content.

Dansky and Brannon (1996) studied the relationship between strategic orientation of home health care organizations and their implementation of TQM practices. They argued that TQM has features of all three dimensions of a strategic orientation—engineering, administrative, and market focus—and proposed that TQM provides a mechanism for implementing strategic orientation. They focused on human resource management practices to test that relationship. They hypothesized that "prospectors" would have the highest TQM involvement but found that "analyzers" showed greater use of quality improvement practices, while "defenders" were less involved in quality improvement initiatives.

Building on previous literature, this article is designed to explore the relationship between levels of environmental uncertainty, specific strategic orientations, and quality approaches and proposes a fit model that should increase the chances of improved firm performance (Miles and Snow 1994). The rest of this article addresses the link between strategy and environmental uncertainty and proposes different levels of uncertainty in the business environment. It deals with types of strategic orientations and explains their dimensions and how they relate to levels of uncertainty as a first step in building the fit model. The relationship between quality, strategy, and competitive advantage are explored and three major quality approaches are outlined. A "fit model" relating quality approaches to strategic types and levels of environmental uncertainty is developed. Finally, conclusions and suggestions for further research are advanced.

STRATEGY AND ENVIRONMENTAL UNCERTAINTY

Businesses operate in an ever-dynamic environment. They adjust and adapt to environmental dynamism through a variety of strategic orientations. Strategy, therefore, is instrumental to the survival of the firm. As Miles and Snow (1994) indicated, firms that match their situation to the environment can improve their performance, while those that do not court failure. The relationship between the firm and its environment, in the strategy-making context, has two major dimensions. First, the firm's basic mission or scope should match its environment. Second, it should aim

at having a competitive edge with other firms that are also trying to get that match (Rumelt 1996). Strategies are formulated to adapt to, respond to, or shape the environment (Johnson and Scholes 1999; Mintzberg 1994). With any significant change in the level of uncertainty, a change in strategy is necessary to keep the organization in harmony with its environment. Environmental uncertainty plays a central role in strategy formulation, for it affects not only the availability of resources to the firm and the value of its competencies and capabilities, but also customer needs and requirements, as well as the competition.

ENVIRONMENTAL UNCERTAINTY

The concept of uncertainty has been a central construct in many research initiatives that focused on the features of the association between a firm and its surroundings (for example, Smircich and Stubbard 1985). With the continuing rise in environmental dynamism and complexity, the environment in which businesses operate will also become increasingly uncertain. The management of uncertainty, therefore, will continue to be the main task of management involving the development of mechanisms to reduce, absorb, counter, or avoid it completely (Jauch and Kraft 1986).

Definition of Uncertainty

A review of the uncertainty literature reveals a variety of definitions of the concept. Uncertainty is seen as lack of information for, and knowledge in decision making (Duncan 1972; Lawrence and Lorsch 1967). It is also postulated as resulting from the indistinct and convoluted causal configuration underlying the internal operations of the firm, its environment, and the complex relationship between the firm and the environment (Collis 1992). Uncertainty is equally viewed as a product of unpredictability (Cyert and March 1963), environmental turbulence (Emery and Trist 1965), and the complexity of influential variables (Galbraith 1973). Further, uncertainty is also perceived as a tangible facet of the external environment, and as an illumination of the perceptual method through which managers interpret their decision situation (Milliken 1987).

The complexity, interrelatedness, and interconnectedness of influential variables in the environment call for segmenting the environment for the purpose of analysis (Fahey and Narayanan 1986). The dimensions of uncertainty include the following:

- *Macro-environmental uncertainty:* This is uncertainty in the organization's general environment, including political, regulatory, statutory, and economic conditions. This uncertainty has the capacity to reduce an organization's capability for mapping out and pursuing strategic choices (Miller and Friesen 1984).
- *Competitive uncertainty:* This is the inability to establish the intensity of competition in the industry in the future, the relative powers of competitors, their future courses of action, and strategies.
- *Market (and demand) uncertainty:* This uncertainty stems from lack of clarity in the dynamics of the market and their effects on the organization's operations, and demand and supply conditions in the industry.
- *Technology uncertainty:* This is uncertainty pertaining to change in the industry's technological resources and capabilities. Technological uncertainty has the potential to undermine an organization's competitive base (Anderson and Tushman 1990).

These dimensions are considered relevant for the purpose of this study. Frequently, organizations are internally oriented in quality planning by looking inward for ascertaining obstacles to quality in outputs (Srinidhi 1998). Although it is useful to seek solutions for quality problems within the organization, limiting the search to the organization alone is practically ineffective. Attention must also be accorded to external elements (such as customers, suppliers, competitors, and technology, which are traditionally considered by management in planning and decision making for the organization) in dealing with quality issues. Thus, the nature, source, and extent of environmental uncertainty will impact quality objectives of firms and quality management. It is hence necessary to

bring uncertainty into focus. This study proposes appropriate quality measures given a particular uncertainty construct. To accomplish this, the authors established different levels of the extent of environmental uncertainty as follows.

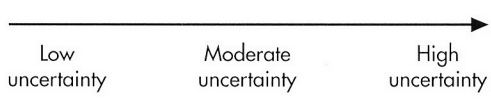
Extent of Uncertainty

The extent of environmental uncertainty here is viewed as a function of the level of increase in environmental dynamism and complexity (Johnson and Scholes 1999). Thus, the more dynamic and complex environmental conditions are, the greater the intensity of uncertainty in the environment. The pace of change in environmental variables determines the level of environmental dynamism. Thus, a dynamic environment is typified by change in environmental variables constituting the uncertainty dimensions (such as technology, customer needs and tastes, demand and supply conditions, and competition). These changes generate uncertainty for the firm. Environmental complexity, on the other hand, is summed up by the amount and diversity of variables influencing the uncertainty dimensions in the environment.

Uncertainty may be viewed in a binary way. It is either that the environment is certain and therefore can be easily predicted, or it is uncertain and therefore extremely difficult to predict. But this view clearly underestimates uncertainty. There is a lot in between uncertainty and certainty. Following is a framework for determining the extent of uncertainty for adapting the management of quality under varying levels of uncertainty. This is represented by a continuum ranging from low uncertainty to high uncertainty, as depicted in Figure 1.

- *Low uncertainty:* In this situation, changes in the environment affecting the uncertainty factors are low (that is, low environmental dynamism). Also, there are few elements influencing the uncertainty factors (low level of complexity). In this situation, for instance, changes in consumer tastes are low, possibly due to there being few factors influencing demand (an uncertainty dimension). Typically, because of the low level of uncertainty, predicting the future is easy in this circumstance. And, the management team is aware of the possible states of occurrences and can encode probabilities in each of the states.
- *Moderate uncertainty:* This situation combines high complexity and low dynamism or low complexity and high dynamism.
- *High uncertainty:* In this situation the environment is highly complex and dynamic and the interconnections between the components of the environment and the organization are unclear. This high level of uncertainty makes decision making difficult. The telecommunications industry, for instance, is facing several uncertainties relating to technology, demand, government regulations, and a host of other macroenvironmental variables. All these uncertainties interrelate in capricious ways making it virtually impossible to predict the environment and develop plausible strategic decisions.

Figure 1 Continuum of uncertainty.



STRATEGIC ORIENTATIONS

There are a number of strategy typologies and taxonomies in the strategic management literature (see, for example, Miller and Friesen 1978; Abell 1980; Porter 1980; Chrisman, Hofer, and Boulton 1988; Segev 1989). The Miles and Snow (1978) strategic orientation typology has been accepted as a robust description of the strategic behavior of firms trying to adapt to their uncertain environment. It reflects a broad and holistic perspective to strategy conceptualization (Venkatraman 1989). It is widely adopted in strategy research (see, for example, Snow and Hrebiniak 1980; Shortell and Jazac 1990; Ramaswamy et al. 1994; James and Hatten 1995).

Miles and Snow (1978) suggest that organizations develop a systematic and identifiable pattern of behavior toward environmental adaptation. The major elements of adaptation and the relationships

among them are conceptualized by what they call an "adaptive cycle" over time. The cycle embodies different business strategies, representing organizations' response to the competitive environment. An organization's strategy addresses three types of problems, which represent the dimensions of the "adaptive cycle:" the entrepreneurial, the engineering, and the administrative. The entrepreneurial problem relates to how an organization orients itself to the marketplace, that is, its market-product domain. The engineering problem refers to the organization's technical system, that is, technology and processes used to produce its products and services. The administrative problem is about how an organization attempts to coordinate and implement its strategies, that is, structure, control, and process issues. Miles and Snow (1978) classify firms by their adaptive decision patterns into prospectors, defenders, analyzers, and reactors.

A *prospector* strategy focuses on product innovation and market opportunities. Firms adopting this strategy tend to emphasize creativity and flexibility over efficiency in order to respond quickly to changing market conditions and take advantage of new market opportunities. The organizational structure of prospector firms is informal and decentralized for more flexibility and quicker response to the changing environment (Stathakopoulos 1998). Prospectors tend to have decentralized control systems and to use *ad hoc* measurements (Miles and Snow 1978).

Russell and Russell (1992) indicate that research in this area points toward a positive link between higher levels of innovation and organic structures characterized by decentralization, lack of formalization, and high levels of complexity (Tornatzky et al. 1983). Decentralization provides managers with more autonomy and more control over resources, enabling them to initiate and test a larger number of innovations (Kanter 1983). Informal structures permit innovation team members' direct access to needed information and skills (Van de Ven 1986). Complexity, combining a set of diverse and specialized skills, is likely to be associated with innovation, as it increases the chances for generating more creative ideas (Van de Ven 1986).

A *defender* strategy searches for market stability, and offers and seeks to protect a limited product line for a narrow segment of the potential market. Defenders try carving out and maintaining niches within industries where competitors find it difficult to penetrate. They compete mainly on the basis of price, quality, delivery, and service and concentrate on operating efficiencies and tight control of costs to maintain their competitiveness. Their structures and processes are formalized and centralized (Stathakopoulos 1998).

Analyzer firms are hybrids, combining the characteristics of prospectors and defenders. They try to balance efficiency and cost control with innovation. They tend to copy and imitate the successful ideas of prospectors, but they systematically assess and evaluate new business ideas before they move selectively to promising areas. Analyzers tend to operate in at least two different product-market areas: one stable, in which they emphasize efficiency, and one variable, in which they emphasize innovation. Their organizational structures are complex, reflecting the diverse markets they operate in. They try to combine characteristics of both mechanistic and organic organizations.

Reactors simply react to environmental change and make strategic adjustments only when forced to do so. They characteristically lack coherent strategy and are unable to respond quickly to environmental changes.

Strategic Orientation and Environmental Uncertainty

Strategic orientation is closely linked to environmental uncertainty. The level of uncertainty may be objective and measurable or subjective and perceived. The important issue is how organizations behave in such environments.

Miles and Snow (1978) postulate that the three strategy types (prospector, defender, and analyzer) can be pursued equally effectively in any industry, irrespective of market environment. Zahra (1987) concludes that firms that follow different strategic postures will tend to perceive their environment differently. Hambrick (1983), Miller (1986), and Snow and Hrebiniak (1980) generally concluded that these strategy types perform differently under different environmental conditions.

In simple and stable environments, where customer needs, and products and services offered to satisfy them are well established, and where technological and other environmental factors are changing slowly, defending a firm's position (through the defender strategy) can be a viable and successful strategy. The Miles and Snow (1978) typology proposes that defenders focus on solving engineering problems and place a high priority on improvements in efficiency and are led by a dominant coalition composed of people with expertise in finance and production. Defenders thrive in stable environments. They isolate and protect relatively stable markets and grow through market penetration (Slater and Narver 1993).

Mintzberg (1973) calls defender firms "adapters," and Miller and Friesen (1982) call them "conservatives." Low innovation (an attribute of defenders, adapters, and conservatives) forces them to operate in environments that are simple and unthreatening (Miller and Friesen 1982). Defenders' structures are mechanistic, rather than organic, which is consistent with the orientation toward control and efficiency. They tend to be centralized, with a detailed control system and an emphasis on cost efficiency. Burns and Stalker (1961) found that mechanistic organizations are successful in stable environments, while organic organizations are more successful in dynamic environments.

In highly dynamic and complex environments, defending a position becomes difficult. Success depends more and more on responding to and keeping a dynamic alignment with the changing environment, through, for instance, organizational innovation, which is found to be positively correlated with environmental uncertainty (Russell and Russell 1992).

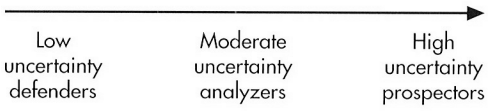
Russell and Russell (1992) explain that high levels of uncertainty generate more innovation through opportunity seeking and adaptation to change (Miller and Friesen 1984; Utterback 1971). Prospectors tend to perceive their environment as highly uncertain (Namiki 1989); or, as Starbuck (1976) suggests, increased levels of innovation create the perception of increased uncertainty among managers (Russell and Russell 1992). Miller and Friesen (1978) suggest that innovators may even shape their environments by introducing new products, technologies, and process. Lumpkin and Dess (1996) indicate that innovators may shape their environment by influencing trends and even creating demand. Chen and Hambrick (1995) define proactiveness, which is an important dimension of entrepreneurial orientation, as taking the initiative to shape the environment to one's own advantage. Keats and Hitt (1988) argue that through its strategy, an organization attempts to shape environmental elements to its advantage.

Prospectors, as the typology suggests, emphasize the entrepreneurial domain of their adaptive cycle. They keep track of evolving trends in their marketplace, aggressively search for new emerging opportunities, and devote more resources to product development. Marketing and research and development capabilities gain considerable importance. People with relevant expertise form the dominant management coalition. Conant et al. (1990) report that marketing competencies of prospector organizations are superior to those of their competitors along a greater number of dimensions than of analyzer, defender, and reactor organizations. They also found that the competency dimension, which appears to differentiate the defender, analyzer, and prospector strategic types the most, was the "new service development."

What Miles and Snow (1978) call *prospectors* are called entrepreneurial (characterized by risk taking and innovations) by Miller and Friesen (1982). They suggest that entrepreneurial firms tend to seek out and exploit the richer innovative opportunities of dynamic environments. They observe that entrepreneurial firms are often found in dynamic and hostile environments, and propose that these firms may be partly responsible for making the environment dynamic by contributing challenging product innovations.

Analyzer firms operate in different environments. They play a role similar to that of defenders in their stable environments, and a role similar to that of prospectors in their dynamic environments, but they are followers not pioneers. They extend carefully into new products from a relatively stable base of customers and products. They preserve their core product-market domains and venture into new ones only after their viability has been demonstrated (by prospectors) (Slater

Figure 2 Uncertainty and strategic orientation.



and Narver 1993). In environments characterized as mildly volatile, analyzers are found to outperform other organization strategy types (McKee et al. 1989). Analyzers combine characteristics of mechanistic and organic structures to deal with their different environments. Their structure is complicated with extensive coordinating roles between functions and intensive planning.

Zahra and Pearce II (1990) reported that Hambrick's (1983) findings support the typology prediction. Hambrick found that defenders tend to thrive in stable, mature, and noninnovative industries, while prospectors capitalize on growth opportunities in innovative, dynamic environments.

This leads the authors to propose the continuum shown in Figure 2. This figure shows that as environmental uncertainty moves from low to high, the adaptive decision pattern should move from defender to prospector. Environments of moderate uncertainty are associated with the adaptive pattern of analyzers.

RELATING QUALITY TO STRATEGY AND COMPETITIVE ADVANTAGE

Reed, Lemak, and Mero (2000) contend that TQM can be a basis for business level strategy. It can help in both gaining and sustaining a competitive advantage. A number of studies have addressed the link between quality and strategic management in general (Pruett and Thomas 1996), quality and performance (Reed, Lemak, and Montgomery 1996; Reed, Lemak, and Mero 2000), quality and competitive advantage (Flynn, Schroeder, and Sakakibara 1995; Powell 1995), and quality and strategic orientation (Slater and Narver 1993; Dansky and Brannon 1996). Many other studies (for example, Phillips, Chang, and Buzzel 1983; Maani et al. 1994; Jacobson and Aaker 1987; Flynn, Schroeder, and Sakakibara 1995; 1997; Forker, Vickery, and Droge 1996; Adam et al. 1997) support the proposition that quality has a positive relationship to business performance.

Recently, Haversjo (2000) analyzed the financial effects of ISO on Danish companies and found the rate of return of companies one year after ISO registration to be higher than their rate of return before ISO registration. He attributed this improvement to an increase in sales made possible after ISO registration. Mann and Kehoe (1994) noted that quality certification was associated with improved business performance at the operational level. Buttle's (1996) survey of 1220 certified UK companies also found that firms following quality certification reported improved operations as well as marketing gains. Inaki, Casadesus, and Gavin (2002) reported that ISO certified companies had generally outperformed their noncertified counterparts. Following is an outline of the main quality approaches.

Quality Approaches

The implementation of quality programs has taken different shapes in different organizations. Generally, three quality approaches have emerged: 1) quality assurance (QA); 2) TQM (Moreno-Luzón and Peris 1998); and 3) total quality learning (Sitkin, Sutcliffe, and Shroeder 1994). These three approaches are explained next.

Quality Assurance

QA is a systematic approach to the pursuit of quality (Collins 1994). The purpose of QA is the conformance of products, services, and processes to given requirements and standards (Moreno-Luzón and Peris 1998). This conformance is achieved through systematic measurement and control to detect special causes of variation and achieve process standardization (Dale, Boaden, and Lascelles 1990). QA includes, and is an extension of, the internally focused quality control (Garvin 1988; Moreno-Luzón and Peris 1998). QA is concerned with quality planning and defect prevention through systems and documented processes

(Garvin 1988). Quality responsibility is shared with all organizational functions with the view to "build in" quality. Top management also plays a major role in this endeavor by ensuring proper coordination and building systems that enable conformance to requirements. This includes reliable equipment, adequate raw material, training, and a reward system. ISO 9000:1994 standards are the most popular QA standards. These standards attempt to build in quality by ensuring conformity to requirements specified during the design, development, installation, and services stages.

The QA structure is characterized by a significant level of centralization and formalization. Centralization is pertinent to supervision and control, while formalization is manifested in the whole concept of ISO 9000 (Jabnoun 1999). QA process management is focused on control rather than improvement. A study conducted by Mallak, Bringelson, and Lyth (1997) revealed that formalization is strongly supportive of ISO certification. Moreno-Luzón and Peris (1998) developed a model for strategic management, organizational design, and quality management. This model placed the QA organization in the high formalization and high centralization quadrant. Because the objective of QA is conformance, the QA control process relies on rules, regulations, and detailed process documentation in addition to supervision and inspection. This control process incorporates the QA emphasis on prevention by providing systems of inputs that enable employees to conform to standards (Jabnoun 2002). It also stresses the analysis of performance data in order to detect special causes of variations.

Total quality management

TQM is a comprehensive management approach aimed at satisfying or delighting customers (Moreno-Luzón and Peris 1998; Dean and Bowen 1994). It combines the QA dimension of standardization and the learning dimensions of continuous improvement and customer satisfaction (Anderson, Rungtusanatham, and Schroeder 1994). TQM stresses the importance of organizational culture in designing, producing, and improving products and services that satisfy customers (Collins 1994; Lewis 1998; Hyland 2000; Jabnoun 2001). There is no agreement on the elements constituting TQM. These elements generally include process management, statistical process control, supplier relationships, and benchmarking (Ahire 1996; Oackland 1991; Youssef and Zairi 1995). However, the most cited components that separate TQM from QA are continuous improvement and customer satisfaction (Zeitz, Johannesson, and Ritchie 1997; Dean and Bowen 1994; Anderson, Rungtusanatham, and Schroeder 1994; Hartline and Ferrel 1996; Juran 1989; Deming 1986). Customer satisfaction is considered to be the main purpose of TQM, while continuous improvement is the main factor ensuring that customer expectations are met.

The TQM approach to control is rather complicated. Clemmer (1992) described the TQM-oriented organization as the opposite of the mechanistic structure. On the other hand, the emphasis of TQM on reducing variations and getting processes to be in control (Spencer 1994) can lead to a conclusion that TQM is a repackaging of Taylorism and the mechanistic organization (Dean and Bowen 1993; Boje 1993). This contradiction is due to an inherent duality in the goals of TQM. On one hand, more control is needed to reduce variations and achieve conformance, and, on the other hand, worker empowerment and learning are needed to meet customer expectations (Dean and Bowen 1994; Sitkin, Sutcliffe, and Schroeder 1994). Process management in TQM is concerned with both control and incremental improvement to meet customer expectations continuously. TQM control is achieved through the shared values of the organization. It is also achieved through written rules and regulations and data analysis. This process is dynamic, however, because standards are changed whenever customers' demands change. Furthermore, employees share the responsibility of checking and correcting defects (Jabnoun 2002).

The structure of TQM is also not simple. Because of its dual goals of meeting customer expectations and achieving conformance, TQM is concerned with both internal and external environments. Jones and Ryan (2002) argued that TQM structure tends to be mechanistic in low-uncertainty environments and organic in high-uncertainty environments. Shea and Howell

(1998) argued that TQM requires both standardization to control its systems and processes and decentralization to allow employees to explore with creative process improvement. Germain and Spears (1999) surveyed 1002 American manufacturing companies and found quality management to be correlated with formalization and decentralization. Evidence from the hospital industry also provides support for the need to have both exploration and control for a successful implementation of TQM (Carman et al. 1996). Douglass and Judge (2001) found that hospitals that exhibited both structural control through standardization and exploration through decentralization displayed a stronger relationship between TQM implementation and financial performance.

Total quality learning

Total quality learning (TQL) was introduced by Sitkin, Sutcliffe, and Schroeder (1994). TQL is concerned about the TQM dimensions of customer satisfaction and continuous improvement, but its approach to these dimensions is learning oriented as opposed to control oriented. This approach would increase organizational capability to explore the unknown and to identify and pursue new solutions (Garvin 1993, 80). A TQL organization is externally focused and its customer satisfaction stresses the need to observe new pools of relevant customers and their needs, as well as to develop new products or services. A TQL organization also focuses on educating customers and contributing to shaping their needs. Shopping carts, for example, were initially rejected by consumers until they were made (educated) to believe that these carts were both useful and socially acceptable (Cringely 1992). When dealing with the uncertain future, it is not enough to rely on customers' expectations because customers may not imagine new products and services. It is therefore necessary to focus on shifting customers' perceptions rather than on finding new ways to meet them (Sitkin, Sutcliffe, and Schroeder 1994).

While TQM stresses improving the exploitation of existing skills and resources, TQL stresses improving learning capabilities. This includes effectively exploring new skills, resources, arenas, and learning from this exploration, and particularly the capacity to withstand failures that may result from such exploration (Sitkin, Sutcliffe, and Schroeder 1994). Learning-oriented continuous improvement focuses on enhancing experimentation rather than on decreasing errors. This means that TQL organizations are willing to do things that provide new directions even when they are not likely to succeed. Leading pharmaceutical companies like Merck and Johnson and Johnson regard a mistake as a badge of honor in their new drug development research centers (*BusinessWeek* 1988). Similarly, because Chapperal Steel has "outlearning competitors" as its main competitive advantage, it relaxes its focus on reduction of variation when dealing with uncertain innovative activities (Leonard-Barton 1992, 32).

While QA stresses control and TQM balances between control and exploration, TQL completely embraces exploration. As with TQM, the organizational structure in TQL is decentralized. TQL structure is informal, however, for written work rules and policies restrict free flow of information and stifle individual initiative, risk taking, and sense of empowerment (Hage 1980). Hierarchical structures are suitable when information has a high degree of predictability (Romme 1996), while the team formal organization can better handle and generate novel information because of its strengthened information generation and processing capacity.

While controlling performance is achieved through systems in QA and through both systems and people in TQM, it is completely substituted with empowerment in TQL. Autonomous work teams are the driving forces leading to organizational renewal necessary to cope with changing environments (Hong 1999).

Uncertainty, Strategic Orientation, and Quality

Relating the quality approaches to the adaptive decision patterns of Miles and Snow (1978), the authors easily detect a match between the defenders and QA. The main objective of defenders is to secure a stable niche in the market, while QA aims at achieving

Table 1 The fit between strategic orientation and quality approach.

Strategic orientation		Dimension	Quality approach	
Defender	Desire for a secure and stable niche in market	Dominant objectives	QA	Conformance
Analyzer	Desire to match new ventures to present shape of business		TQM	Meeting customer expectations
Prospector	Location and exploitation of new product and market opportunities		TQL	Finding new pools of customers and developing new products
Defender	Low uncertainty	Environmental uncertainty	QA	Low uncertainty
Analyzer	Moderate uncertainty		TQM	Moderate uncertainty
Prospector	High uncertainty		TQL	High uncertainty
Defender	Centralized, functional/line authority	Structure	QA	Centralized, formal
Analyzer	Combination of organic and mechanistic		TQM	Combination of decentralization and formalization
Prospector	Decentralized, informal, product and/or market centered		TQL	Decentralized informal autonomous teams
Defender	Extensive use of formal planning	Planning	QA	Extensive formal planning
Analyzer	Intensive planning		TQM	Formal, continuous feedback process
Prospector	Emphases on flexibility		TQL	Flexibility, innovation
Defender	Centralized, detailed control	Control system	QA	Formal relying on systems
Analyzer	Very complicated; coordinating roles between functions (e.g. product managers)		TQM	Combination of systems and values
Prospector	Decentralized control, use of ad hoc measurements		TQL	Decentralized, based on values

conformance. Both defenders and QA are internally focused. They emphasize control and efficiency, and require a formal and centralized organization. Defenders tend to thrive in stable environments (Hambrick 1983). Similarly, internally focused and control-oriented quality practices characterizing QA are associated with higher performance in conditions of low uncertainty (Sitkin, Sutcliffe, and Schroeder 1994; Reed, Lemak, and Montgomery 1996). Both QA and defenders use detailed formal planning and emphasize systematic control.

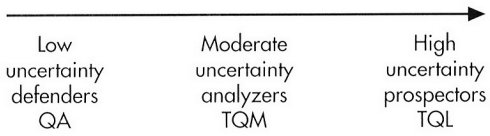
The prospectors find common ground with TQL. Prospectors want to locate and exploit new products and markets while TQL scans for new pools of customers, new customers' needs, and learn how to satisfy them with new products and services. Both prospectors and TQL are externally focused. They emphasize learning, rely on people and their values, and attempt to shape, not just meet, customer needs. They emphasize flexibility, pursue innovation, and manage control through shared values. Furthermore, they both have informal and decentralized structures (Romme 1996; Hong 1999). Because of its customer focus and learning orientation, TQL is likely to be more successful in environments of high uncertainty (Reed, Lemak, and Montgomery 1996; Sitkin, Sutcliffe, and Schroeder 1994). Lawrence and Lorsh (1967) found a positive relationship between innovating to satisfy customer needs and environmental uncertainty. Similarly, prospectors perceptions of increased uncertainty

(Namiki 1989) render them more creative and innovative (Russell and Russell 1992).

TQM seems to match analyzers. Analyzers want to match new ventures to the present shape of business, while TQM seeks to meet customer expectations. While TQM combines learning and control, analyzers combine the characteristics of prospectors and defenders. TQM combines formalization and decentralization, while analyzers combine characteristics of mechanistic and organic structures. Both TQM and analyzers focus on the process and the people who produce the product. Both are concerned with internal and external environments and seek to meet customer expectations while ensuring process control. They both seek improvement but only to the extent of meeting customer expectations. Analyzers play a role similar to that of defenders in their stable environments. As such, they tend to match more closely with QA where there is more emphasis on process control and where the structure is formal and centralized to ensure efficiency and conformance to requirements. In dynamic environments, analyzers play a role similar to that of prospectors and tend to match more with TQL. In environments characterized by moderate uncertainty, analyzers outperform organizations adopting other strategic orientations (McKee et al. 1989).

The more control-oriented TQM yields higher performance in conditions of low uncertainty. On the other hand, an externally focused, learning-oriented TQM yields higher firm performance in conditions of high uncertainty (Sitkin, Sutcliffe, and Schroeder 1994). Reed et al. (1996) proposed that a more customer-oriented TQM is likely to realize higher revenues when uncertainty is high, while a more operational oriented TQM is likely to be more effective when uncertainty is low. Since TQM maintains a dual control and learning orientation, it is likely to be more successful in environments of moderate uncertainty (Reed, Lemak, and Montgomery 1996). Table 1 summarizes the fit between strategic orientation and quality approach in terms of the dimensions of dominant objectives, environmental uncertainty, structure, planning, and control system. The previous discussion leads to the following propositions:

Figure 3 Uncertainty, strategic orientation and quality approach.



- Proposition 1: Firms using QA will be more effective when the adaptive decision pattern is defender and uncertainty is low.
- Proposition 2: Firms using TQL will be more effective when the adaptive decisions pattern is prospector and uncertainty is high.
- Proposition 3: Firms using TQM will be more effective when the adaptive decision pattern is analyzer and uncertainty is moderate.

The previous discussion leads the authors to propose the continuum shown in Figure 3. This continuum is similar to the one in Figure 2 with the addition of quality approaches. QA is proposed to be at the left end of the continuum where the adaptive decision pattern is defender and uncertainty is low. TQM is proposed to be in the middle of the continuum where the adaptive decision pattern is analyzer and uncertainty is moderate. Finally TQL is proposed to be at the right end where the adaptive decision process is prospector and uncertainty is high.

- Proposition 4: The relationship between levels of uncertainty, types of strategic orientations, and quality approaches follows the continuum shown in Figure 3.

CONCLUSION

Environmental uncertainty compounded by increased consumer awareness and demand for more value in products and services has further changed the business landscape, whereby success for any firm now depends greatly on its ability to provide quality products and services to consumers. Business organizations, therefore, are now faced with a triangle of issues that they must address to build on viability and profitability. This is in the form of uncertainty, strategy, and quality.

This study was aimed at exploring the relationship between these three elements, uncertainty and strategy, and strategy and quality.

From the authors' analysis, using the Miles and Snow typology of strategy, they have established a match between the "defender" strategic orientation and QA: when they interact in a more stable environment (low uncertainty), the firm tends to strive. A match was also established between "prospector" strategy and TQL. They have interactive characteristics vis-à-vis the environment and some studies have found a positive relationship between the interaction of "prospector" firms and TQL on firm performance as highlighted in the study. The characteristics of the "analyzer" typology in the authors' analysis were matched to TQM. And by maintaining a dual control and learning orientation, TQM relationship with analyzer strategy is most likely to be successful in a moderately certain business environment.

The authors' study has focused on the general business environment, so the conclusion reached here must be treated in a general sense. It will be most appropriate for future studies in this area to empirically investigate the effects of sectoral differences in terms of industry, size, and age of firms.

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