Title

Managerial information behaviour: Relationships among Total Quality Management orientation, information use environments, and managerial roles

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Authors

Simard, C

Rice, Ronald E

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Abstract

This paper integrates disparate literatures to develop a summary model that proposes how different orientations (control or learning) toward a major organizational change effort, Total Quality Management, will generate different managerial information use environments, will require different managerial roles, and will thus involve different managerial information behaviors, in order to foster successful TQM implementation.

Overview

A specific goal of this paper is to better understand the role of general managerial information behavior in influencing the success of a major organizational change effort, Total Quality Management (TQM) (Brown, Hitchcock, & Willard, 1994; Grant, Shani, & Krishnan, 1994; Masters, 1996). TQM is intended to improve organizational climate, processes, and performance, with the distal goal of improving or exceeding customer satisfaction (Sitkin, et al., 1994; Spencer, 1994) and thus long-term organizational performance. However, evidence suggests that a majority of TQM implementation attempts fail or are incomplete (Beer & Eisenstat, 1996; Dooley & Flor, 1998; Grant et al., 1994; Hiam, 1993; Reger, et al., 1994; Sitkin, et al., 1994). This paper proposes a complex set of relationships involving basic TQM orientations, managerial use of information, and managerial roles that may influence the extent to which quality practices are successfully implemented and managed.

Total Quality Management: Components, Evolution, Orientations

TQM's Major Components

Total Quality Management involves a wide array of factors (Spencer, 1994), but its three major components are customer satisfaction, continuous improvement, and a holistic view of the organization (Sitkin, et al., 1994). Hackman and Wageman's (1995) review identified four primary assumptions underlying TQM theory: (1) quality is less costly than poor workmanship, and essential to long-term organizational survival; (2) employees will care about and improve quality if provided tools and training, and management attention to the ideas -- thus management must remove fear, traditionally caused by punishment for poor performance, comparative evaluation, and merit pay; (3) organizations are systems with many interdependencies and cross-functional problems, so representatives from all relevant functions must be involved; and (4) quality is the responsibility of senior management, which must be committed to the process. They also identified four primary TQM change principles: (1) focus on work processes, not simply outcomes; (2) analyze the root causes of uncontrolled process or outcome variance; (3) use systematically collected data throughout the problem-solving cycle; and (4) promote learning and continuous improvement.

TQM's Evolution

Berger (1999) argues that there have been four cycles in the century-old quality movement. The first one is inspection (mid 1800s-1920s), conducted after production by technical specialists to correct for defects. Then, statistical quality control (1920s-1950s), applied to mass production, was used to assess the limits of variation, and achieve quality as a "form of scientific inspection" (p. 7). The third cycle was quality assurance (1950s - 1980s), which

challenged the prior narrow conceptualization of quality by a more comprehensive Japanese ideology. Managerial quality principles involved project-orientation, teams, problem-solving, training, mobilizing management and employees, learning, adapting, and a wider range of quality constituents than just customers (Berger, 1999; Reeves & Bednar, 1994). The fourth TQM cycle, strategic or total quality management, emerged in the 1970s-1980s. By the 1980s, TQM began to be seen as a competitive wedge (Cole, 1999; The Conference Board, 1991), and by the mid-80s, quality had been largely reconceptualized as emphasizing consumer needs and preferences, and service, and was greatly facilitated by the Malcolm Baldrige award signed into law in 1987. This cycle involved concepts such as national strategy, leadership, productivity, global competition, organization-wide involvement, and multiple constituents.

By the early 1990s, 93% of Fortune 500 companies had adopted some form of TQM (Berger, 1999). By now, the fundamental principles of quality management have not only diffused widely, but have been both relabeled, and overtaken, by more general as well as newer approaches, such as competitive benchmarking, empowerment, and innovation honors.

Total Quality Management Orientations: Control and Learning

Comparing the orientations. The four TQM cycles may be said to emphasize two underlying but contrasting TQM orientations: total quality control (TQC) and total quality learning (TQL) (Sitkin, et al., 1994). Under the control orientation, management creates control systems that maintain and improve quality, with specific roles assigned and communicated to employees, assessed by statistical measures and performance feedback, with clearly defined goals and expectations (Soin, 1992). Reeves and Bednar (1994) claim that most quality improvements in the U.S. were based on the interchangeability of machine-made parts, which was possible only through increased conformance to specifications.

On the other hand, the learning orientation de-emphasizes hierarchical control and distributes managerial functions to teams (Carson & Stewart, 1996). American companies operating in highly competitive environments have contributed to the formulation of these TQM practices by recently moving away from control practices to encourage risk-taking and innovation (Cole, 1999) and "ongoing experimentation" (Khurana, 1999, p. 91).

Thus, it seems reasonable to suggest that organizations might differ in their definition of TQM and their interpretation of the general three principles proposed by Sitkin, et al. (1994) (noted above), according to their control or learning orientation. For example, continuous improvement in TQC is based on the exploitation (March, 1996) of existing resources; TQL seeks to improve the organization's learning mechanisms through exploration of existing knowledge, and links process improvements to strategic planning (Cole, 1999; Zink, 1998).

Conceptually general and useful, though somewhat arbitrary, distinctions. Many TQM scholars have remarked on both the distinction as well as the relationship between control and learning paths in organizations in general, and in quality management in particular (Juran, 4th edition, 1988; Klein & Kraft, 1994; Manz & Stewart, 1997; Reeves & Bednar, 1994; Sia & Neo, 1997; Thompson, 1998). (Many have critiqued the controlling, bureaucratic, and demanding nature of TQM: Barker, 1993; Dean & Bowen, 1994; Grant, et al., 1994; Schmidt & Finnigan, 1992). Most organizations, while emphasizing one aspect more than the other, will still have to achieve a balance of control and learning principles (Khurana, 1999; Sitkin, et al., 1994). Further, both the control and learning orientations of TQM contribute to organizational learning, but in different ways. TQC represents instances of single feedback loop organizational learning (Argyris & Schön, 1996; Hackman & Wageman, 1995; Sitkin, et al., 1994): by modifying organizational action, errors are corrected within organizational norms and established variance levels (Choo, 1995; Khurana, 1999). In single-loop learning, however, the organizational norms and values guiding actions are unchanged (Argyris & Schön, 1996). TQL, on the other hand, is

conducive to double feedback loop organizational learning (Sitkin, et al., 1994). This type of learning links the observed outcomes of actions to organizational norms. Observed actions provide a first feedback loop to organizational members, who then act as a second feedback loop to existing organizational "theories-in-use" (Argyris & Schön, 1996). These observed outcomes lead to a challenge and redefinition of organizational norms and strategies guiding action.

TQC, TQL and information: A contingency approach. According to Sitkin, et al. (1994), organizations will emphasize TQC or TQL depending on the level of environmental uncertainty they face. A low-uncertainty environment is more conducive to TQC, where profitability is achieved through improving known processes, reducing variances, focusing on well-defined customer needs, anticipating contingencies, and designing optimal specifications (Khurana, 1999, p. 95). Within single feedback-loops, process improvements will occur through the examination of statistical information about customer requirements, satisfaction rates, production cycle times, number of defects and variations, and conformance specifications. In highly uncertain environments, however, process requirements must keep changing in order to adapt to environmental changes, including new customers and different customer needs. Experimentation and risk-taking will become essential to gather more knowledge about the changing environment (Khurana, 1999). Information relevant to TQL will come from all parts of the environment and the organization, and will be widely enacted, interpreted, constructed (Weick, 1995).

An Example from Hewlett-Packard. Hewlett-Packard, a firm renowned for its quality successes, is a good example of the different emphasis on control or learning in quality management depending on environmental conditions (Cole, 1999). In the 1980s, HP imported TQC practices from YHP, their Japanese division, in response to increasing quality requirements in the new computer products market. HP was very successful in implementing TQC, resulting in a dramatic decline of failure rates. However, as the competitiveness of the computer industry increased in the 1990s, the focus of HP's quality efforts moved from control to learning. Cole (1999) illustrates this move by showing the differences between two quality programs at HP: QMS1, which was implemented from 1987 to 1991, and QMS2, from 1992 to 1997. QMS1 was a TQC initiative: it relied on the "plan, do, check, act cycle for improvement" (Cole, 1999, p. 188). The QMS2 quality effort instead sought to link improvement projects with strategic objectives (Cole, 1999), an instance of second-loop learning. Finally, a further move toward TQL was made by Richard LeVitt, HP's director of quality in the 1990s, again in reaction to increasing environmental uncertainty: "managers perceived that they faced rising and rapidly changing customer expectations for more flexible, speedier, and higher levels of service" (Cole, 1999, p. 196). LeVitt criticized the rigidity of TQC practices and deemed them inappropriate to the increasing environmental uncertainty faced by the organization. These changing environmental conditions led to the "Quality 1 on 1" initiative in 1995, which clearly advocates TQL practices, such as direct creative interaction with customers. The program was also highly decentralized, with each division bringing its own ideas and practices to the organizational effort, encouraging "multiple experimental activities" (Cole, 1999, p. 197).

Information Use Environments and Managerial Roles

The concept of an Information Use Environment (IUE) (Taylor, 1996) addresses the contexts in which specific groups of individuals operate and how these contexts influence information the flow, use, and perception of information within a group. An IUE is characterized by (1) groups of people, (2) their organizational and environmental settings, (3) the types of problems and possible resolutions they are faced with, and (4) their typical handling of information in problem-solving activities (Katzer & Fletcher, 1996; Taylor, 1996). Both the TQM orientation and the IUE should both be strongly influenced by the degree of environmental

uncertainty facing the organization, as well as should shape each other, through influencing what type of information is available to organizational members, and retained and distributed by the organization. What does this set of relationships mean for the roles that managers must perform in order to successfully implement and manage quality initiatives? Different types of managers operate in different IUEs, being from different backgrounds, organizations, hierarchical positions, and environments, and therefore participate in different managerial roles. Furthermore, since an IUE is based on what a specific group perceives as useful information, managers will develop a perception of what information is useful to the roles they perform the most. Hence, not only will the IUE shape a manager's roles, but the roles performed by the manager will in turn shape the IUE. The following sections explore these relationships.

The Manager's Information Use Environment and Its Implications for Total Quality Control and Total Quality Learning

In order to understand how these components influence each other, we must first describe the manager's typical information use environment. We can then examine how the IUE and TQM orientation influence each other in different contexts of environmental uncertainty, and which managerial behaviors within specific contingent conditions would be theoretically associated with successful implementations of quality management.

Managers as a Set of People with Consequential Decision Styles

Sets (or groups) of people refers to characteristics shared by members of a group, such as profession, educational background, decision-making style, etc. (Taylor, 1996). Of course, managers differ in many ways, such as background, organization, and industry. However, as a set of people, they tend to share some common characteristics and similarities in managerial decision-making (Agor, 1986; Browne, 1993; Feldman & March, 1981; Isenberg, 1986; Katzer & Fletcher, 1996; March, 1994).

Managers are limited in their attention, communication, comprehension and memory capabilities (March, 1994). When making decisions, managers do not consider all possible alternatives, do not know all possible courses of action and are unaware of all the consequences of their choices (Browne, 1993, March, 1994, p. 200). Managers typically "muddle through" information toward decision-making (Katzer & Fletcher, 1996). Most higher level managers rely heavily on intuition (Agor, 1986) and oral communication (Rice & Shook, 1990) and show a tendency to base their decisions on available information without searching for more information (Feldman & March, 1981; Isenberg, 1986) or to use organizational information (and even the channels and sources used to obtain and interpret information) as a symbolic representation of the legitimacy and accountability of the decision (DiMaggio & Powell, 1983; Feldman & March, 1981; Katzer & Fletcher, 1996). Managerial information will therefore be contingent upon the organization's norms, beliefs, and values (Daft & Lengel, 1986; Dewhirst, 1970-71; Feldman & March, 1981).

TQC and decision-makers' information. In TQC, information such as benchmarking, variance assessment, and performance metrics would be gathered and analyzed to gain control over production processes, to provide consistent and high customer satisfaction. However, managers' reliance on intuition may prevent them from recognizing the importance of measurement data necessary for TQM (Brown, et al., 1994).

TQL and decision-makers' information. In TQL, managers will prefer ambiguous, qualitative information, and avoid hard data which would narrow the problem definition or preclude sense-making. Thus, the emphasis shifts from managerial decisions and information to understanding managerial interpretations and information behaviors (Daft & Lengel, 1986; Glazer, 1998; Weick, 1995). However, making decisions based on the availability or legitimacy of information instead of its accuracy, relevancy, or quality – i.e., "satisficing" (March & Simon,

1958) -- is not conducive to continuous improvement and innovation, acting as a barrier to the double-loop learning sought by TQL.

The Setting: Organizational Culture and Information Structure

The setting in an IUE includes the organization's culture, structure, and style, as elements shaping "attitude[s] toward information and consequently affect[ing] the information behavior of its employees" (Taylor, 1996, p. 103). For example, organizational cultures vary in the extent to which they require or encourage information gathering and sharing (Dewhirst, 1970-71; Feldman & March, 1981). A cultural view of TQM implementation emphasizes the need to match individual goals and TQM orientation with organizational goals and orientation (Brown et al., 1994; Glazer, 1998; Spencer, 1994). Davenport, Eccles and Prusack (1996) identified two models of information structure that effectively support different information behaviors of organizational members: monarchy and federalism. In a monarchy, top management defines the information needs and structure, and all relevant information must be reported to top management. In a federalist structure, consensus is achieved among the organizational members to identify relevant information and agree on a reporting structure. The setting also includes the environment of the organization, since each industry will have different degrees of information availability and dissemination patterns (Wilenski, 1967).

Total Quality Control, organizational cultures, and information structure. A monarchical information structure is most conducive to TQC. In this structure, the manager will be responsible for accumulating information about processes and customer requirements to focus decision-making toward process improvement. An organizational culture favorable to TQC will emphasize employee feedback on work processes and the sharing of information regarding customer requirements and production processes between management and employees. Communication will be mainly vertical, following top-down and bottom-up patterns. However, decision-making will ultimately come from management and take the form of requirements for improvement to be transmitted from management to employees.

Total Quality Learning, organizational cultures, and information structure. TQL, on the other hand, necessitates a decentralized, or federalist organizational structure, horizontal interaction, and the free-flow of information (Grant, et al., 1994; Masters, 1996; Sitkin, et al., 1994). Knowledge sharing will facilitate the generation and adoption of innovations (Rogers, 1983; Spencer, 1994, p. 458).

The Setting: Organizational Structure

Total Quality Control and organizational structure. Wigand, Picot and Reichwald (1997, chapter 5) identify four organizational structures. In the first type, a market-oriented mass production structure, tasks have a low degree of variability, with standardized products, and a low degree of complexity, with a large-scale serial production method. The mechanistic organization, which is conducive to a mass production structure (Burns & Stalker, 1961; Wigand, et al., 1997), gears TQM efforts toward the improvement of product quality and improvement of production efficiency (Spencer, 1994, p. 449). This production type is therefore appropriate for TQC only. The second and third types of production structure are included in the general category of mixed serial production type: an order-based serial production or a market-oriented serial production. In an order-based serial production, the task is highly variable because of changing customer requirements, but low in complexity because production is organized in a serial process. In a market-oriented serial production, the task variability is low because products are standardized, yet task complexity is high because market requirements are multiple. In a mixed serial production type, there are considerable possibilities for new forms of work structures, job rotation, and job enlargement. This organizational production structure enables a balance between the TQC and TQL components of TQM. Job enlargement and rotation will

enhance knowledge sharing as fostered and required by TQL, but will remain limited because of the control requirements of serial production.

Total Quality Learning and organizational structure. The last production type, an order-based customized production structure, is characterized by high task variability, with changing customer requirements, and high task complexity, with customized production for each customer. This production structure is best suited to a highly uncertain environment, where both customers and needs keep changing, and a high level of organizational flexibility is required. This production structure is therefore conducive to TQL: it enables a high degree of freedom for new forms of work structures, high possibilities for job rotation, job enlargement, job enrichment, and autonomous groups. The manager operating in an order-based customized production will be part of an IUE conducive to a learning-oriented TQM effort.

The Setting: The Organizational Environment

Total Quality Control and organizational environment. When the environment and customers are well known and predictable, the organization can focus on specific, well-defined customer requirements and the improvement of existing processes. Information about task enhancement is likely to include numbers about efficiency and defects, description of existing processes, data of customer satisfaction and requirements, and procedures and guidelines to be followed by employees for single-loop task improvement. Therefore, TQC information is likely to be low in equivocality and emphasize the use of hard data.

Total Quality Learning and organizational environment. When organizations operate in a highly competitive, dynamic and uncertain environment, with changing customer preferences, the firm cannot focus solely on stable processes, but must continuously innovate (Johnson & Rice, 1987; Khurana, 1999; Sitkin, et al., 1994). Too much focus on existing customer requirements may hinder innovation by failing to represent novel possibilities that go beyond existing customer requirements. Information conducive to TQL is therefore likely to be highly equivocal, emphasizing soft data and future-oriented information (Taylor, 1996).

Problems and Resolution of Problems

Within IUEs, problems can be placed on a continuum based on their perceived degree of structure (well/ill structured), complexity (complex/simple), familiarity (familiar/new), and agreement on assumptions (agreed upon/not agreed upon) (Taylor, 1996). Problem resolution requirements will vary across sets of people and thus will influence information use, decisions about information searches, perception of information usefulness, assumptions about possible solutions, and contextual limitations and opportunities. Taylor suggests that information used for problem resolution can be placed on eight continua. On the quantitative continuum, information can be located from quantitative to qualitative; on the data continuum, information can be characterized by hard or soft data. It can also be placed on a temporal continuum from historical information to future-oriented information. The solution continuum ranges from single solution to multiple options; the focus continuum ranges from factual information on well-defined problems to diffuse, equivocal information. Information can also be applied (instrumental), substantive (descriptive), or theoretical on the specificity of use continuum. The aggregation continuum ranges from clinical information to aggregated information. Finally, information can be causal (describe why something happens) or diagnostic (describe what is occurring).

Total Quality Control, problems and problem resolution. TQC information for problem resolution will focus on existing and past customer satisfaction data and production processes, and short-term problem resolution on the temporal continuum (Spencer, 1994). Information about task enhancement is likely to contain hard, quantitative, and applied data about production cycle time, as well as statistical information on variation and customer satisfaction rates (McKinnon & Bruns, 1992, p. 39). The focus of the information will be factual,

emphasizing causal relationships between process improvements and customer satisfaction. The use of instrumental data will enable the manager to provide specific instructions to employees concerning task improvements. On the solution continuum, information is more likely to focus on single solutions for specific improvement problems. The information will be applied (instrumental information about the implementation of improvements as directions for employees) and substantive (description of existing processes) on the specificity of use continuum. Finally, on the aggregation continuum, TQC is likely to emphasize clinical information about single solutions, represented in the form of process improvements.

Total Quality Learning, problems and problem resolution. In organizations emphasizing TQL, product innovation requires the manager to show abilities for complex problem-solving (Dougherty, 1996). Since learning information is likely to be highly equivocal, complex and ambiguous (Sitkin, et al., 1994), the focus of the problem will involve diffuse information regarding ill-structured problems. Managers are likely to make extensive (though not necessarily exclusive) use of qualitative and soft data to describe the problems they are facing. Their use of intuition (Agor, 1986; Katzer & Fletcher, 1996) on the solution continuum will probably emphasize the use of soft data, from which conclusions must be inferred (Taylor, 1996). Furthermore, as causal links are not easily identified in highly uncertain environments, the information will be diagnostic, explaining what is happening rather than why it is happening. Similarly, the solution continuum will emphasize a range of options. The problem complexity will also lead the manager to aggregate information from various sources and use information as a diagnostic tool. TQL emphasizes the long-term growth and evolution of the organization (Sitkin, et al., 1994; Spencer, 1994). Therefore, TQL managers will choose information that is future-oriented and theoretical. The lack of causal links will make it difficult to identify one single, predictive solution to the problem at hand, so liaison relations and trust (discussed below) will be necessary to persuasively construct a shared decision with some outcome uncertainties.

Managerial Roles, IUEs, and TQM Orientation

This section proposes that managers in IUEs associated with TQC or with TQL will emphasize different roles. Mintzberg (1980) described three categories of 10 interrelated managerial roles: interpersonal, informational, and decisional. He emphasized, though, that these roles are all part of the manager's job and are influenced by personal characteristics (Mintzberg, 1994), as managers perform a wide variety roles in different proportions and time periods (Mintzberg, 1980), and across settings and cultures (Gibbs, 1994).

Managerial Interpersonal Roles and TQM

Total Quality Control and managerial interpersonal roles. As a *figurehead*, the manager will use authority and status to enforce/reinforce the TQC message and vision in interpersonal relationships. A monarchical information structure will be consistent with this use of formal authority in interpersonal interactions. The manager will also act as an external *liaison* (O'Dell & Jackson Grayson, 1998; Rogers, 1993), linking groups of suppliers to their customers to achieve a more systemic view of how the organization's various processes relate to one another. The manager will also act as a *leader* in the organization, ensuring that employees perform their tasks in accordance with specified improvements and performance criteria, and will also seek feedback from customers, systems, and employees on those improvements.

Total Quality Learning and managerial interpersonal roles. Informal network management is especially crucial in TQL contexts, because the social and technical ties involved rely on promises, reciprocal social and task payments, and acceptance, rather than authority and sanctions (Carson & Stewart, 1996). Therefore, if the organizational structure and culture emphasize learning, managers will more likely act as facilitators of change, innovators, opinion leaders and *liaisons* (Rogers, 1983). In a TQL organization, managers are active information

seekers, and are able to handle high levels of environmental uncertainty and information ambiguity (Auster & Choo, 1996; Katzer & Fletcher, 1996). They must also make TQL easy to try for employees as part of their daily activities and diffuse observable results throughout the organization (Brown, et al., 1994). They must act as complexity-reducers by simplifying information about the TQL process and double-loop learning, serving as translators who can frame issues in common terms for multiple communities, and knowledge brokers who foster participation rather than mediation (Brown and Duguid, 1998). As organizational members communicate with a trusted source about the innovation, information becomes less uncertain, and they will become less resistant to change. As internal liaisons, managers must therefore facilitate the creation of networks based on mutual cooperation, trust, and strong interpersonal relations. This communication process, by maximizing knowledge sharing, also fosters the emergence of innovative ideas in the organization (Brown, et al., 1994; Johnson & Rice, 1987). As an external *liaison*, the manager will also link the organization and its environment, promoting a holistic view of the organization as a system which is open to environmental information, again increasing knowledge sharing. Finally, as a *figurehead*, the TQL manager carries and reinforces the quality learning culture in his or her interpersonal contacts. However, these interpersonal interactions should be based on trust and consensus (federalism) rather than on formal authority (monarchy) (Fidler & Johnson, 1984, in Johnson et al., 1997, p. 327).

Managerial Informational Roles and TQM

Total Quality Control and managerial information roles. As *monitors*, control-oriented managers gather information about organizational processes to implement incremental improvements. They also seek out and evaluate TQC information in customer requirements, and from other organizations to benchmark TQC activities. But this adoption must avoid over-reliance on explicit rather than tacit information, as many practices are not easily codified (O'Dell & Jackson Grayson, 1998). As *disseminators*, the managers in a TQC organization will be responsible for relaying process efficiency, improvement, and customer satisfaction information to employees, as prescribed by a monarchical information structure, following a "top-down cascade model" (Cole, 1999, p. 199). This disseminator role is especially valued by employees in uncertain and risky environments, as mediated or top-level messages are too remote from users' actual activities to be highly credible, practical, or influential (Lewis, 1999). As *spokespeople* for a TQC organization, managers are an important carrier of the quality message to the organization's customers and environment, emphasizing product quality, process efficiency, and customer satisfaction.

Total Quality Learning and managerial information roles. The manager's role as a *monitor* of environmental activity, such as through environmental scanning (Auster & Choo, 1996), boundary-spanning (Mintzberg, 1979), or enactment (Weick, 1995) is crucial for TQL. This information will focus on all parts of the external environment: existing and potential customer groups, needs, products, competitors and allies, as well as an ongoing monitoring of all events pertaining to the industry. Thus, competitive intelligence is the primary focus of the manager's monitoring activities in a learning organization (Desai & Bawden, 1996; O'Dell & Jackson Grayson, 1998). By monitoring internal quality information, the manager can be a *disseminator* of quality stories and tacit information, which foster organizational learning (Cole, 1999, p. 199; March, Sproull, & Tamuz, 1991; O'Dell & Jackson Grayson, 1998). The dissemination pattern of TQL is unlikely to be hierarchical (Grant et al., 1994) and should involve the organization as a whole, as prescribed by a federalist information structure. TQL information is thus part of multiple sets of people with multiple IUEs within the organization, and not a single homogenous fact for the entire organization. Finally, managers as *spokespeople* will emphasize the organization's quality focus on innovation and continuous learning, both

within the organization, and to the environment. External displays of TQL partially serve to improve the organization's legitimacy, especially once other organizations have adopted that orientation (Dimaggio & Powell, 1983).

Managerial Decisional Roles and TQM

Total Quality Control and managerial decision roles. TQC requires the manager to act mainly as a *resource allocator*. The role of resource allocator will mean seeking continuous improvement of production processes to decrease defects, reduce costs and improve production time (McKinnon & Bruns, 1992, p. 82). By assessing existing processes through single-loop feedback, the resource allocator will make decisions about necessary modifications and investments for process improvement. Managers will turn TQM information into improvement requirements. To assess the impact of process improvement, however, managers will also seek TQC information from the external environment. The use of hard customer satisfaction data will enable the manager to allocate resources to match the product to existing customer requirements. Observation of other organizations will also enable the resource allocator to benchmark organizational processes to those of existing leaders.

Total Quality Learning and managerial decision roles. With an emphasis on double-loop learning, the manager as *entrepreneur* in a TQL organization focuses on new possibilities rather than on existing competencies (Sitkin, et al., 1994). Because the focus of learning in TQL is on exploring new possibilities and keeping up with a changing environment, TQL information is most likely to come from intense interpretation of internal processes, and of the organization's environment. Competitive and customer intelligence becomes especially important in a TQL organization (Desai & Bawden, 1996, p. 482). The manager as entrepreneur in TQL will not focus on existing customer needs but on creating new needs, seeking new customers, and identifying new process and product possibilities (Sitkin, et al., 1994).

A TQL organization operating in a highly uncertain environment will likely face more unexpected events and therefore emphasize the managerial role of *disturbance handler*, especially to facilitate double-loop learning about both necessary changes and the ongoing context of unexpectedness. The use of rich media such as face-to-face and telephone interaction for monitoring and scanning (Auster & Choo, 1996, p. 265; Rice & Shook, 1990) is especially necessary for interpersonal negotiations and disturbance handling, as it enables managers to reduce information equivocality effectively (Daft & Lengel, 1986) and understand the complex organizational environment and personal meanings associated with TQL. But the use of printed sources also enables managers to "carry out a general, wide-area viewing of the external environment in an efficient manner" (Auster & Choo, 1996, p. 267), relevant to the roles of entrepreneur and disturbance handler.

As a *negotiator*, the manager will seek to establish consensus on innovation implementation and act as a facilitator of change. Negotiators establish deals for the implementation of these innovations within and outside the organization. To achieve this role, the manager should have an extensive knowledge of the organization's structure and culture.

Conclusion

Table 1 shows the relationships between TQM orientation (TQC or TQL), managerial information use environment (IUE), and managerial roles (decisional, interpersonal, and informational). Different managerial roles are emphasized in different IUEs. It is important to note that this table represents a vast simplification, dichotomizing control and learning, making clear distinctions among managerial roles, and explicitly separating IUEs. However, this table can help us understand the appropriate roles and information behaviors of the manager in organizations with different quality orientations, and generate testable hypotheses, warranting more research on the relationship between the manager's IUE, roles, TQM orientation, and

information seeking and dissemination. Figure 1 summarizes the essential components of the elaborated contingency model and relationships among them. The model portrays the manager at the center of information and communication processes in TQC and TQL orientations.

--- Table 1 and Figure 1 Go About Here ---

While of course a simplification of the influences on TQM outcomes, this model might help to explain (or even prevent) failures by looking at possible mismatches. For example, achieving an appropriate mix of managerial roles may be especially problematic in educational institutions, due to the different cultures of academics and administration, with their different formal and informal communication patterns, conceptualizations of information distribution, value of autonomy and task completion, meaning of various quality symbols (such as "customer" and "service"), emphases on time-span and objectivity of information, and bases for authority and status distinctions (Chen & Rodgers, 1995; Gillotti, 1999; Ruben, 2004; Wiedmer & Harris, 1997). Another contribution of the model is to highlight the crucial role of information behavior by managers in TQM in particular and organizational practice in general. Little has been said in prior TQM research about the role of the manager as an information handler in TQM implementation, or about the contingent information use environments in which managers must implement TQM. Identifying potential complexities may help in avoiding conceptual and research design confounds in future quality management research and implementation.

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Table 1.
TQC and TQL Information Use Environments and Implications for Managerial Roles

Information Use Environment	**Total Quality Control**: efficiency and productivity through process improvement and customer satisfaction: exploitation	**Managerial Role**	**Total Quality Learning**: continuous innovation and learning: exploration	**Managerial Role**
Set of people: decision-making style	Decision-making based on close examination of production process and customer information	**Decisional role:** resource allocator	Decision-making based on environmental/org. information	**Decisional roles:** entrepreneur; disturbance handler; negotiator
Setting: environmental uncertainty	Low	**Informational role:** Monitor organizational processes, customer needs and satisfaction, benchmarking on other organizations **Decisional role:** resource allocator **Interpersonal role**: liaison between suppliers and customers	High	**Informational role:** monitor environment **Decisional roles:** disturbance handler; entrepreneur **Interpersonal role:** liaison: link environment and org. members
Setting: organizational structure	Market-oriented mass production	**Informational role:** monitor existing processes	Order-based customized production	**Informational role:** monitor innovation information in the organization, monitor new customer needs and innovations
Setting: information structure	**Monarchy:** information needs defined by management; all information reported to management	**Information roles:** monitor of employee task information; disseminator of process requirement information and improvement results	**Federalism:** information sharing based on consensus	**Decisional role:** negotiate consensus **Informational role:** disseminate innovation information based on consensus and trust **Interpersonal role:** liaison: foster emergence of communication networks for innovation diffusion
Setting: organizational culture	Quality means meeting customer requirements through high product quality and process efficiency	**Interpersonal roles:** figurehead: use formal status to carry TQC message; opinion leader: act as leader of process improvement **Informational role:** spokesperson of quality (control) culture	Quality means innovation and learning: promoting diversity, knowledge sharing, free-flow of information	**Interpersonal roles:** figurehead: use informal status to carry TQL message; opinion leader: act as facilitator of change **Informational role:** spokesperson of quality (learning) culture
Problem resolution; information used for problem resolution	Well-defined problems Hard data; factual, instrumental, quantitative information; emphasis on causal relationships	**Decisional role:** resource allocator **Informational roles**: monitor organization and environment for information relevant to problem solving; disseminate task-related problem information to employees	Ill-structured, complex problems Soft data; future-oriented information; diffuse qualitative data; aggregation of information	**Decisional roles:** entrepreneur, disturbance handler **Informational roles:** monitor environment and organization for information relevant for problem solving; disseminate problem information throughout the organization

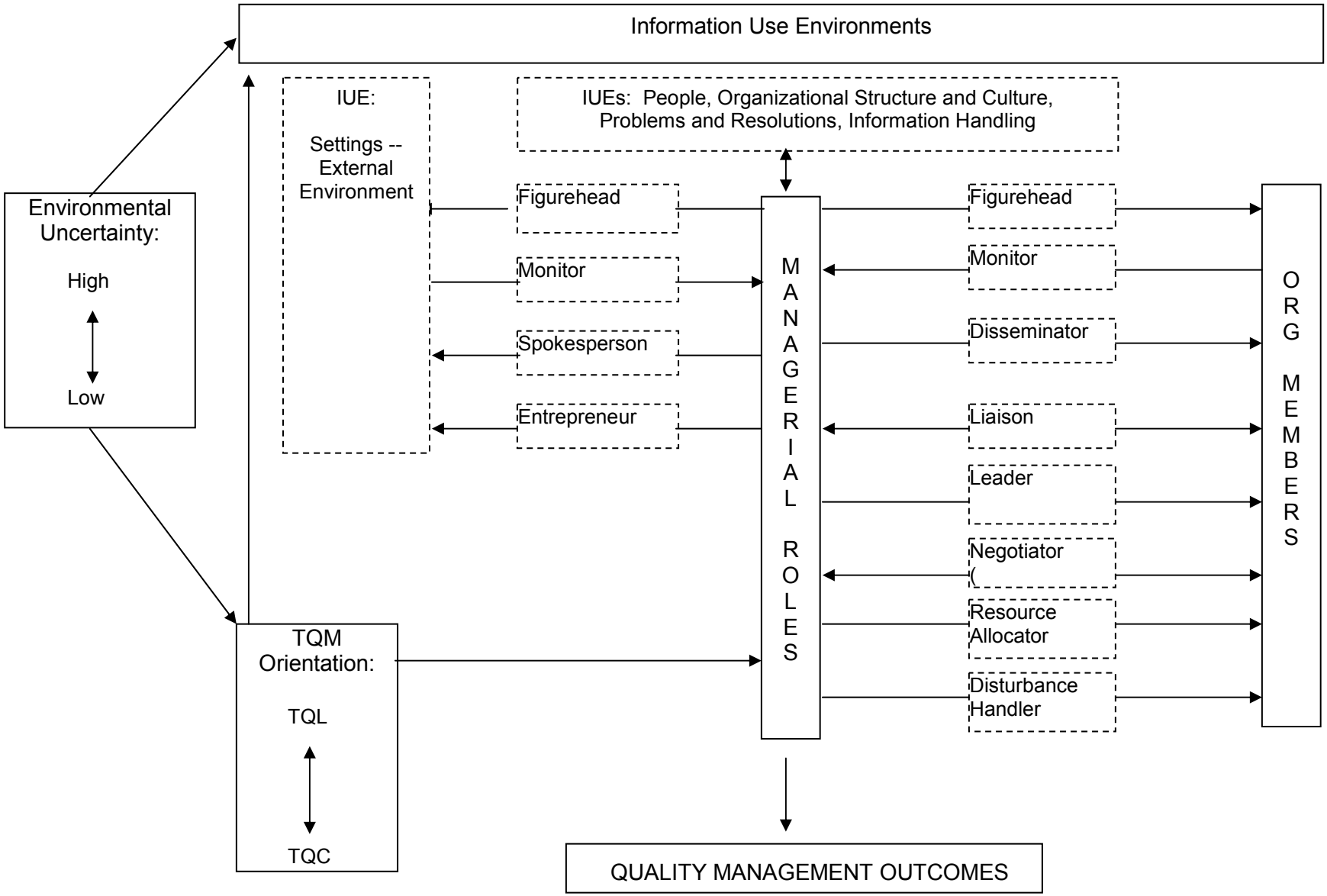

Figure 1.
Model of Contingent Interrelationships among Environmental Uncertainty, TQM Orientation, Information Use Environments, Selected Managerial Roles, and Quality Outcomes