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Managing Change: Creating a Learning Organization Focused on Quality

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Abstract

This article describes a case study summarizing the application of the learning organization concept, and the implementation of a learning organization change process focused on improving quality in a high-technology medical instruments company. The change process was designed to facilitate the transformation of the company from a production mentality, where the priority was getting manufactured products out-the-door, to an organization that began to systematically embrace quality as a pervasive process to manage. The change process focused on creating a learning organization, and targeted the existing mental models for understanding organizational events and taking action related to managing quality among all executives, managers and key staff. However, rather than communicate the change process to company personnel as focused on becoming a learning organization, the change process was described more pragmatically – as focused on continual improvement in quality. Literature and perspectives from conceptual views of the learning organization, and key implications from models of change are discussed. A major intention of this article is to provide academic researchers and practicing managers with an understanding of how the learning organization concept was successfully implemented in a medical instruments company. In this regard, one important role for academic researchers is to publish articles describing organizational concepts so that executives and managers understand their real world applications, their bottom-line benefits, and key factors related to their successful implementation.

Key words: learning organization, change, organization development.

Senge's (1990) notion of the learning organization, and the concept of the knowledge-based organization, has received significant attention in the literature during the past decade (Armstrong and Foley, 2003; Beckard and Murray, 2000; Bierly, Kessler, and Christensen 2000; Cohen, 1998; Davis and Botkin, 1994; Drucker, 1997; Easterby-Smith and Araujo, 1999; Ellinger, Ellinger, Yang, and Howton, 2002; Hamal and Prahalad, 1994; Holt, Love, and Li, 2000; Kim and Mauborgne, 1999; Jackson, Hitt, and DeNisi, 2003; Marquardt and Reynolds, 1994; Murray and Donegan, 2003; Nonaka, 1991; Quinn, 1992; Senge, Kleiner, Roberts, Ross, and Smith, 1994; Steward, 1997; Swieringa & Wierdsma, 1992; Wang and Ahmed, 2003; Watkins and Marsick, 1993; and Watkins and Marsick, 1996). The literature stresses that organizations can create a key source of competitive advantage, embrace innovation, and improve bottom-line results by developing capabilities for becoming a learning organization. According to Senge (1990), organizations have the capacity to learn and to change in specific ways based on processes and techniques focused on learning to learn. His seminal book, *The Fifth Discipline*, provides an in-depth discussion of "the core disciplines" for building a learning organization, namely: mental models, personal mastery, systems thinking, shared vision, and team learning.

Whereas the concept of the organizational learning is easily understood by academics, applying the learning organization to improve company practices and performance may present a challenge – both to academics as well as to executives. In this regard, tangible benefits from applying the concept of the learning organization may not be understood by executives and managers. A related dilemma may be determining how to begin a change process focused on becoming a learning organization. Moreover, executives, managers, and key staff in many companies, especially resource scarce companies, or companies operating in a start-up mentality, may have low commitment to embrace a concept that they do not fully understand. In this regard, academics as well as executives and managers could benefit from actual descriptions of companies that have successfully applied the concept of the learning organization to increase their competitive capability.

The purpose of the article is to describe a change process designed to facilitate the transformation of a medical instruments company from a production mentality, where the priority was

getting manufactured products out-the-door, to an organization that began to systematically embrace quality as a pervasive process to manage. The change process focused on creating a learning organization, and targeted the existing mental models for understanding organizational events and taking action related to managing quality among all executives, managers, and key staff. Moreover, as will be discussed, rather than communicate the change process to company personnel as focused on the potentially abstract concept of becoming a learning organization, the change process was described as focused on continual improvement in quality.

Mental Models and Managing Change

According to Senge (1990) and Senge, Kleiner, Roberts, Ross, & Smith (1994), the concept of mental models provides a powerful foundation upon which a change process can be developed. As will be discussed later, the notion of mental models has been a component of several models of organization change. In essence, mental models are the cognitive, sense making maps that managers and employees use to guide their thoughts about a situation. They can be thought of as an implicit mental compass that focuses all managers and employees on how to think about key dimensions of organizational reality. Discussing mental models, Senge (1990) states, "Our mental models determine not only how we make sense of the world, but how we take action" (p. 175). All employees, regardless of title or function, have somewhat different mental models or ways of thinking about a particular phenomena or concept such as quality customer service, innovation, etc.

From an organizational change perspective, it is critical to ensure that executives, managers and key staff have the opportunity to engage in a process of dialogue in order to explore – and if necessary, to change – the mental models that are in existence about key organizational issues. Changes in these mental models, in turn, provide a foundation for the emergence of new organizational values and new ways of getting work done through people. Discussing the powerful impact of mental models, Beckett & Murray (2000) state that, "Managers, in an effort to solve problems, have too often reverted to past solutions because these are entrenched in the mental models and have paid little attention to subverting the necessity of convention" (p. 126).

The notion of mental models has been implicitly discussed as the first stage in several models of managing change. In this regard, the first of six change stages of Beer, Eisenstat, & Spector (1990) is to mobilize commitment to change through joint diagnosis of business problems; the first of eight change stages of Kotter (1996) is to establish a sense of urgency – through communicating of relevant data; and the first of seven change stages of Juran (1995) is a breakthrough in attitude concerning the necessary change. In essence, all these models stress that a key starting point for managing change is to create a data gathering process that enables key company personnel to better understand key organizational phenomena. This data, in turn, serves to establish a common vantage point that change is needed in a key strategic or operational area or areas.

The fact that various mental models exist for key organizational phenomena, e.g. quality, customer service, innovation, and that these mental models affect how people think about and act on organizational events, implies that a key starting point for organizational change initiatives targeting quality is to facilitate a process that allows key company personnel to better understand their own and other's mental models.

With regard to quality, there are at least five dominant models, which held by some managers and staff in any organization (Senge, Kleiner, Roberts, Ross, & Smith, 1994)

1) Status Quo – Quality is not important at our organization. We hire only the best people, and our products are good as anyone else's;
2) Quality Control – Quality is the process of inspecting and catching mistakes before they get shipped and our customers have to deal with them. We hold people accountable for their actions;
3) Customer Service – "Quality is listening to the customers and solving their problems as quickly as possible at no extra change. Mistakes and bugs can't be avoided, so we have an 800 number and field service personnel ready to go twenty-four hours a day;
4) Process Improvement – Quality is using statistical process control reengineering, and other quality tools to understand and eliminate unacceptable variation in our process,

products, and services. We believe people, particularly in teams, are a resource for learning about inefficiencies and making changes; and

5) Total Quality – Quality is a transformation in the way we think and work together, in what we value and reward, and in the way we measure success. All of us collaborate to design and operate a seamless value-adding system which incorporates quality control, customer service, process improvement, supplier relationships, and good relations with the communities in which we operate – all optimizing our common purpose (p. 445-446).

The Change Process Used at Ultrasound Coronary Systems

Company Background

The company, which will be referred to as Ultrasound Coronary Systems (UCS), develops, manufactures, and markets intravascular ultrasound imaging catheters and systems to aid in the diagnosis and treatment of cardiovascular disease. The companies products include imaging consoles, which project ultrasound images of the interior heart on a computer screen, and a family of disposable imaging catheters, which are inserted into a vein in a patient's leg, and then skillfully moved toward the patients heart.

The company's strategy was to become the worldwide leader of disposable imaging catheters. UCS employed 125 employees and was functionally structured with vice-presidents for finance, operations, research & development, and sales & marketing, as well as a recently hired director for quality assurance, all of whom reported to the CEO/president. A variety of engineering project managers reported to the operations or research & development executives.

Like many start-ups, UCS was not focused on quality, but on developing products that would meet the needs of the emerging market for this new medical procedure. As initial product development resulted in products that passed FDA rigorous testing standards, UCS began to focus on manufacturing and marketing. However, during that time, no comprehensive quality process or initiative was developed to carefully integrate a quality focus throughout the organization. From the vantage point of the categorization of Senge et al., (1994), the mental model of quality that pervaded the organization at this time had been the notion of quality control, namely, quality is the process of inspecting and catching mistakes before they get shipped and our customers have to deal with them. This very notion of quality created a perceptual barrier to the design and implementation of an integrated quality system at UCS.

Focusing on Quality

Prior to focusing on quality, the preliminary consulting effort took place during the first four months and focused on overall organization assessment. The consultant conducted in-depth interviews with 29 executives, managers, and key staff regarding key organizational issues, concerns, and barriers to effectiveness in a variety of areas. In this regard, a major concern of a change agent at the initial stage of entry should be building trust, commitment, and generating valid data (Block, 1981).

A content analysis of the interview data, which comprised over 600 specific responses to open ended questions focused on a variety of management and business areas, identified the following five organizational-wide problem areas: 1) structure, 2) staffing, 3) communications, 4) product development, and 5) quality. A key outcome of this intervention was that the CEO organized task forces to develop and implement actions in two out of the six areas: product development and structural. At this stage however, quality was not addressed because the CEO and his staff decided that new product development and structural problems needed to be addressed prior to targeting quality. The new product development problems focused on a variety of project management concerns. The structural issues focused on the coordination and reporting relationships of several technical functions. At a meeting facilitated by the consultant, senior management decided that these two areas had to be addressed prior to comprehensively assessing quality.

Although the preliminary intervention did not specifically focus on creating a learning organization, it did provide managers and staff with an initial understanding of the variety of mental

models implicitly affecting how organizational events and problems were perceived and acted on. To a large extent, the pervasive mental model among the executives had been to discuss issues and make decisions from a closed systems, functionally oriented perspective. There had been little discussion, listening, and responsiveness to the perspectives from functions below the executive level about the impact that work interdependence had on a variety of operational systems. To a large extent, problems in new product development would be perceived as isolated, linear events specific to a department or function. For example, problems might be viewed as, " look at what engineering is doing", or, "why is marketing doing this", or "R&D is causing problems by doing that".

As the task forces began to openly discuss issues and events from an interdependent vantagepoint, a new mental model began to emerge. This new mental model focused on understanding the interrelatedness of organizational events and actions. As key personnel began to discuss and explore the interrelatedness and interdependence of cross-functional perspectives, it served to enhance their understanding of quality. They also began to share information more openly, and also began to explore the implications from past actions – successes and failures – when they analyzed new product development issues. As personnel began to openly discuss factors related to new product development successes and failures, issues related to quality began to emerge during the discussions.

As the task forces, executives, and managers began to discuss and analyze factors affecting quality, a more formal change intervention was initiated. This intervention focused on comprehensively assessing quality management practices and systems. The two key objectives of this intervention were: 1) reinforce and build on the foundation of a learning organization that had been shaped during the first intervention; and 2) apply the shared mental models about quality management practices and systems to assess, analyze, and implement specific improvements in quality.

In contrast to the first intervention, which was initiated by the consultant, the Vice-Presidents for Operations, Research & Development, and the newly hired director of Quality Assurance (QA) initiated the focus on quality. Prior to the hiring of the QA director, quality assurance had been the responsibility of the Operations VP. Since the newly hired director of quality assurance was going to implement key changes in the quality system, this intervention was initiated to provide a framework for understanding and action taking.

The two vice presidents and the QA director requested the consultant's assistance with a company-wide data gathering process that focused on employee perceptions of various factors that either supported or constrained a quality focus. In essence, this process would provide a company-wide forum to understand past mental models and actions that had shaped the current quality system in place.

Data Gathering

The process began a few weeks after the new QA director was hired, who met with the OD consultant for several hours on two occasions to share views about quality and about organizational change. During a three-week period, the consultant conducted hour-long interviews with 32 key personnel, including all executives, and managers and key personnel from engineering, marketing, quality assurance, operations, and human resources. Ten open-ended questions were asked to provide a context for these individuals to discuss their mental models about quality. The questions were: 1) What is your overall impression of quality at UCS? 2) What things or factors contribute to quality? 3) What things or factors get in the way of quality? 4) What's your impression of senior staff's commitment to quality? 5) Could you mention a project where there was high focus or commitment to quality? What were the various things that contributed to the high focus? 6) Could you mention a project where there was low focus or commitment to quality? What were the various things that contributed to the low focus? 7) What specific recommendations do you have for there to be a greater focus on quality at UCS? 8) Can you think of any additional systems, actions, or programs that need to be implemented to support a greater focus on quality? 9) In terms of your job, what changes could result in an increase in quality? 10) I want to focus on the work of other key individuals or departments that you work with that affect your job. What changes in the work of other individuals or departments could increase quality in your department?

Data Analysis

Interviews of 32 UCS personnel focused on these ten questions and resulted in 726 total responses. These responses were content analyzed and categorized, and summarized in a comprehensive feedback report. The 20-page report was organized into three areas: 1) Factors/Actions supporting quality; 2) Factors/Actions constraining quality; and 3) Recommendations from employees. The specific categories for each of these three areas are enumerated below. The report featured summary statements of select comments from the actual interviews to provide realism and richness to the interview data. However, to honor the confidentially ensured by the consultant, names were not attached to actual comments.

In essence, the data gathering and feedback process provided all executives, managers, and key staff with a forum for learning and understanding company-wide perspectives about quality. This process also facilitated in learning and understanding the variety of mental models implicitly shaping thinking and action on quality. At a company-wide meeting, the CEO and the QA director discussed action implications of the report, namely, that work teams and task forces would be meeting during the next year months to formulate and coordinate actions to improve the quality system under her leadership.

The content analysis of the interview data identified the following seven factors as supportive of quality: 1) the performance of incoming quality assurance; 2) the commitment of employees; 3) the top level support from the CEO and the VP Marketing; 4) the empowering style with which the R&D function was managed; 5) recent staffing and structural changes; 6) programs recently implemented that focused on such areas as improving validation and documentation, survey feedback from customer/users, and meetings to discuss and respond to customer/user complaints; and 7) the cooperation and informal communication across the organization.

The following five factors identified as constraining quality were: 1) corporate culture, which was described as a rush to market mentality, a focus on volume, not quality, mentality, and a reactive, not proactive, mentality; 2) lack of understanding among some assemblers of quality problems; 3) lack of clarity in select job roles, for example, the role of a particular quality assurance engineer was not clear to numerous personnel; 4) problems in various aspects of internal communications; and 5) various aspects of the technical documentation and validation system.

Seven broad areas of recommendations were identified and discussed by UCS personnel: 1) clarify/define quality and develop quality standards; 2) focus on the whole quality system; 3) improvements in the clean room that focus on staffing and training; 4) clarify the role of the quality assurance engineer; 5) improve customer contact; 6) improve communication in a variety of specific areas; and 7) follow-up, namely, the emerging focus on quality had to be ongoing, with appropriate data-based program development, implementation and evaluation. It should be stressed, once again, that each of these seven categories of recommendations were derived directly from the specific interview data. The report featured the actual interview comments in quotes appearing below each of the seven broad recommendations.

Discussion

The fact that many of the factors that were perceived as either supporting or constraining quality focused on non-technical areas served to expand the mental models of UCS personnel. Executives, managers, and key staff began to understand the diversity of factors that could affect quality. This, in turn, provided the context for personnel to consider the relationship of these factors to the larger quality system when they planned and implemented improvements in quality during the ten months. For example, rather than solely focus on analyzing technical issues impacting on quality, numerous issues related to cross-functional coordination, internal communication, clarifying and reassessing job roles, and executive compensation solely based on sales volume were analyzed and modified.

The fact that non-technical issues related to organizational structure, culture, and human resources were now thought of as important factors to consider when managing quality supports several models of organizational change. Beer et al. (1990) conclude that most change programs don't work because they only focus on organizational area, rather than on the interdependencies

among areas. Several other change models also stress the critical importance of targeting technical, structural, social-cultural, and human resource factors (Leavitt, 1964; Tichy, 1983; Nadler, 1988; Kanter, Stein, & Jick, 1992).

Perspectives by Nonaka (1991) on the emergence of tacit knowledge generation in learning organizations provide an additional lens for understanding change at UCS. Nonaka (1991) contends that the creation of new knowledge in an organization does not emerge simply by processing objective information. Rather, the creation of new knowledge from which organizational learning can emerge involves capturing the tacit, subjective views and insights of numerous personnel who have relevant work experiences. In this regard, the change process at UCS facilitated the transformation of tacit, implicit knowledge into explicit knowledge. To a large extent, the interviews with 32 UCS key personnel provided a formal process to capture and organize their implicit, subjective views of factors/actions supporting and constraining quality – how key UCS personnel were thinking about quality – in essence, their collective mental models. At the same time, the interviews provided a formal process to capture and organize implicit, subjective views about recommendations for action.

Organizational change at UCS was also facilitated by a several other key factors. One key factor was top management support for the change process, which has received widespread attention in the change literature cited. In this regard, the CEO, and his five direct reports were all highly supportive of the change process. Moreover, as stressed by Block (1981), the consulting process was carefully designed to ensure that the consultant's role and expertise was facilitating a change process, rather than technical expertise in managing quality. The role of the senior management team, however, was to engage in facilitated discussion about quality – with the consultant, among themselves, and in numerous meetings with other UCS personnel. One key outcome of these interviews and discussions was to generate valid data to support an emerging agenda focused on quality management at UCS. A second key outcome of the consulting process was the generation of commitment among UCS personnel that quality was theirs own and to manage, and not the responsibility of the consultant (Block, 1981). Moreover, the fact that all the recommendations and actions to improve quality were generated by UCS personnel – and not by the consultant – served to generate high commitment to the change process. Their utilization of organization-wide task forces by the CEO during the initial change process also served to make the change process their to own and manage.

A final factor that facilitated organizational change was the small size of the organization. Although small businesses are usually constrained by such factors as lack of managerial time and technical expertise, and limited financial and human resources, they also have particular strengths (Moreno-Luzon, 1993; Lee and Oakes, 1995; Ghobadian and Gallear, 1997; and Yusof and Aspinwall, 1999; Yusof and Aspinwall, 2000). Smaller organizations are generally more flexible, and more responsive and less bureaucratic than larger organizations. Since they have flatter structures and simpler systems, faster communication and decision-making can take place. Fewer employees facilitate face-to-face communication and reduce barriers to the emergence of a supportive social system

The smaller size of UCS, coupled with a change process characterized by gathering data from executives, managers, and key personnel, provided a foundation for designing a quality improvement focus that was appropriate for the specific needs of the organization. In this regard, Yusof and Aspinwall (2000) stress the need for small and medium companies to modify, adapt, and revise formal quality management programs so they are relevant to their particular needs and characteristics. They contend that quality management in smaller organizations, "must not be a fully blown approach but a gradual progression and selection of appropriate quality tools and initiatives as and when necessary, with the ultimate aim of continuous improvement in the organization" (p. 31).

Concluding Perspective

The organizational change interventions that focused on quality improved performance at UCS in a variety of ways. During an interview with the CEO one-year after the end of the 14-

month consulting relationship, he reported that new products were being developed with greater efficiency and that new product development cycle-time had decreased. The yield rate of catheters also increased; and fewer products were returned from cardiovascular surgeons due to technical defects. With respect to quality, he stressed that USC began to embrace a "Process Improvement" and a "Total Quality" model, and moved away from the "Quality Control" model that had been operating. Most notably, this process changed the way quality was thought about, acted on, and managed, which is essence an emergent learning organization (Senge, 1990).

The CEO also stated that UCS had integrated the collaborative assessment-planning-implementation process – that was first used to focus on quality – into all phases of operational planning and problem solving. From the author's vantagepoint, the most significant impact of the change process was that a new mental model for problem solving that has emerged at UCS; namely, a collaborative process to assess/diagnose factors contributing to problems followed by the collaborative planning and implementation of change.

The intention of this case study was to provide academic reseachers and practicing managers with an understanding of how the learning organization concept was successfully implemented in a medical instruments company. In this regard, one important role for academic researchers is to publish articles describing organizational concepts so that executives and managers understand their real world applications and their potential bottom-line benefits.

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