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Identification of Key Predictors of Rapid Change Adaptation in a Service Organization: An Exploratory Study that Also Examines the Link Between Rapid Change Adaptation and Organizational Capability

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Abstract

This exploratory study attempted to identify key predictors of rapid change adaptation in a service organization. The results of this study suggested that rapid change adaptation would be more likely to occur in an organizational setting within which there is an emphasis on process and quality improvement, innovation, rapid technology assimilation, and internal customer focus. Rapid change adaptation was in turn found to be highly associated with the following organizational outcomes: quick product/service introduction, quality performance, productivity, and competitiveness.

Introduction

With the dawn of the 21st century, organizations are increasingly being confronted with the prospect of change. As organizations transform the way they produce goods and modify the way services are delivered, numerous social, economic, and technological pressures bombard them. To name a few, these include market fragmentation, shrinking product lifetimes, global production networks, workplace diversity and mobility, simultaneous inter-company cooperation and competition, and the business process reengineering movement (Oden, 1999). Given the intensity of these challenges to organizational survival and competitiveness, it is not surprising that most organizations find themselves operating in more complex, unpredictable and dynamic environments (Lewin & Johnson, 2000). To cope, most organizations consider themselves to be in a state of continuous improvement where they must accelerate the pace and effectiveness of their change strategies (Oden, 1999). The contemporary significance of organizational change is indicated by the recent proliferation of terminology such as organizational transitioning, organizational renewal, organizational effectiveness, and organizational improvement (Lundberg, 1999).

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Felkins, Chakiris, and Chakiris (1993) define the management of change as an interactive process that links daily work practices with strategic, directed, change programs and performance goals. Pettigrew, Woodman, and Cameron (2000, p. 698) elaborate: "Change should refer to sequences of individual and collective events, actions, and activities unfolding over time in context." French and Bell (1999) note that inquiry about organizational change is founded in organization development theory and practice. They join the two constructs by defining organizational development as planned change in an organizational context. These definitions call to mind issues of process, pace, people, and environmental context. The focus on process contrasts with earlier views that change is a discreet movement from one state to another (Lewin, 1951). The assumption that change is continuous rather than episodic suggests that change is ongoing, evolving, and cumulative in its attempt to yield a new pattern of intentions (Orlikowski, 1996). The role of people in these definitions suggests that an organization's members both shape and are shaped by change (Lundberg, 1999). Finally, the importance of organizational context and its impact on change is reflective of socio-technical systems theory (Pasmore, 1988).

While ways of thinking about change have evolved over time, differences persist in how scholars view its unfolding and management. Perspectives range from a fairly mechanistic approach whose principles assume an objective reality, to a more dynamic and interrelated view of organizational behavior based on participation, dialogue, and teamwork. These worldviews can be categorized into a typology of four perspectives: organizational behavior, critical humanism, organizational culture, and systems theory (Felkins, Chakiris, & Chakiris, 1993). Behaviorists see change as a rational, measurable, and directed process with causal relationships that are predictable and easily manipulated. Critical humanism as a change perspective is centered on experience and encourages individuals and their organizations to question dominant ideologies. A cultural approach to change suggests an interpretive

sense of reality where change occurs through social interaction based on cultural norms that are unique to a given group or organization. The systems approach places an emphasis on the gestalt of interdependent processes that respects the complexity of organizational relationships and structures. It is the last two perspectives that have most informed the study reported in this paper.

French and Bell (1999) note that as the history of organizational development has matured, certain change models advanced the practice. For example, Lewin (1951) introduced the idea that change is a three-stage process where behavior moves from one state to another and where change results from interplay with opposing forces. Kilman (1989) specified a total change system that consisted of critical leverage points within five sequential states. The notion of first (transactional) and second (transformational) order changes was the basis for the Burke-Litwin model of organizational change (Burke, 1994). The thinking was that transactional changes that impacted the work climate were easier to effect than deeper transformational changes designed to impact the deeper layer of the organization's culture. Porras and Robertson's model (1992) describes change as part of a system in interaction with its environment. They offered the premise that organizational development interventions alter features of the work setting that impact an individual's behavior and lead to individual and organizational improvement. This evolution in perspectives and practices formed the foundation for a current breed of change models that emphasize the integration of social and technical systems in supporting the continuous process or change.

Socio-Technical Systems

The socio-technical systems approach is based on the notion that organizational survival requires systems that are open and able to interact with their environment. Oden (1999) portrayed an open system as one that has

> A dynamic relationship with its environment, receiving various inputs, transforming them in some way, and producing outputs. Receiving inputs in the form of material, energy, and information, along with feedback regarding outputs, allows the open system to offset the process of decline. Moreover, the open system adapts its internal processes and structures to its environment as the need arises. (p. 14)

The organizational system can be divided into two subsystems: the social and the technical. This perspective assumes that the two factors of technology and people are essential to the change process. Neither alone is the driver of change. Oden described the application of social change without technology as merely automation, and the application of technical reengineering without social change as merely reorganization.

Lunberg (1999) offered an interesting view of how the social side of the socio-technical systems perspective works through his theory of social rules. This theory views organizations as social systems, comprising members who are agents with varying degrees of influence. Rule systems govern the transactions among members of the social system by sharing the nature, impact, content, and outcomes of interactions and relationships. As these rules

are created, learned, maintained, and modified by individuals within the organization, its members also develop distinct identities and associated capacities to influence social rules in varying contexts. An additional assumption is that rules can be both a positive and negative force. While rules are necessary to make social transactions easier and more predictable, they also serve as barriers to change. The notion of social rules is reflective of culture theory as cultural norms are socially learned and reinforced (Spradley, 1979). Blumer (1969) noted that it is the social process that creates and upholds the rules and not the rules that invent group life.

The technical side of socio-technical systems theory can be linked to an interest in reengineering, which emerged in the early 1990s as a relatively new management approach. In general, the first step in a reengineering effort is to rethink the organizational system in terms of its key processes and the technology available to carry them out. After the necessary process and technology related changes are introduced, the focus shifts to how the organization is managed and structured (Lawler & Mohrman, 1998). Lawler and Mohrman note that it is mostly a "top-down" process, which requires significant redistribution of power and authority and significant investment in information technology. According to French and Bell (1999), reengineering "does not appear to pay much attention to the social system of organizations relative to change processes and the redesign of work" (p. 231). As a result, reengineering has failed to produce the desired outcomes in terms of competitive advantage. "Recent reports, supported with the viewpoints expressed by the founders of this movement, claim that more than 70 percent of reengineering efforts have failed to achieve their purposes" (Lawler & Mohrman, 1998, p. 205). High failure rates may be attributed to many people defining *reengineering* as *downsizing*, which according to numerous studies rarely accomplishes its goals (Lindsay & Petrick, 1997). Such dismal outcomes appear to confirm the need for both a social and a technical perspective in achieving effective change through practice and research.

Organizational Culture

Many scholars have argued that sustainable change cannot occur without a clear understanding of the culture (Ellis, 1998; Detert, Schroeder & Mauriel, 2000; Fiorelli & Feller, 1994). The foundation of socio-technical change must be that all cultures operate from cognitive models by creating belief systems to filter expectations for appropriate and inappropriate behavior—a type of meaning-making. In this sense, causality (cause and effect expectations) is a form of socially constructed meaning (Spradley, 1979). A kind of code emerges that drives a culture's sense of rules for what it will tolerate and how people will interact. Organizations contain a host of cultural beliefs that prescribe work norms (Schein, 1985, 1990; Trice & Beyer, 1993). Examples include perceptual differences about ways to resolve conflict effectively, the information needed for sound decision-making, the criteria for promotion (Hansen & Kahnweiler, 1997), and the appropriate style of leadership (Schein, 1985, 1990). As a construct, one of the most well-known definitions is by Hofstede (1980) who defined culture as "the collective programming of the mind (p. 13)." That is, a manifestation of the value systems of various groups that is able to sustain itself over long periods of time. Beliefs about work tend to be more powerful motivators of behavior than formally stated organizational requirements, such as those found in employee handbooks or company policy and procedure manuals

(Martin, 1982). Yet, organizational members are often unaware and unable to articulate their beliefs until they have a problem that cannot be answered or does not fit the mold. They must then reconsider their knowledge and the value of the "rule" they have created and maintained (Felkins, Chakiris, & Chakiris, 1993).

Research suggests that organizations capable of innovation and rapid adaptation are those that are characterized by high trust cultures. Trust promotes cooperation (Mayer, Davis & Schoorman, 1995; McAllister, 1995), which can contribute to organizational effectiveness through extra-role behavior and better citizenship (Organ & Ryan, 1995; Van Dyne, Cummings & Parks, 1995). Many researchers have additionally argued, for example, that high-trust cultures support cooperation and teamwork (Jones & George, 1998), innovation and synergy (Fukuyama, 1995), strategic alliances (Das & Teng, 1998), and a competitive advantage (Barney & Hansen, 1994). For trust to transpire, certain conditions are necessary, which include risk and interdependence (Rousseau, Sitkin, Burt & Camerer, 1998) and vulnerability (Bigley & Pearce, 1998). In essence, for trust to occur, individuals must be open and willing to believe in the goodness of others and depend on them for help in times of perceived threat. Moreover, as situations become increasingly unfamiliar, the influence of one's predisposition to trust has more impact on one's behavior. Thus, alien situations, such as the modernization of an organization's practices, will enhance a natural inclination to trust or distrust while greatly influencing the willingness to depend, share, and cooperate.

The Context of Quality and Change

According to Harvey and Brown (2001, p. 366),

> Today's managers are being challenged to provide leadership in new and changing conditions. Customers, competitors, employees, and stockholders are all placing pressures on management for innovation and change at a rapid pace. One approach that has emerged to meet these changing forces is termed total quality management (TQM).

Although the popularity of TQM has somehow faded in recent years, the tools and various techniques introduced as part of the TQM movement have become important drivers of change in organizations. TQM can be characterized as a people-focused management system whose philosophy and guiding principles for continuous improvement are based on teamwork and employee empowerment (Harvey & Brown, 2001; Lindsay & Petric, 1997). "Through well structured processes, TQM aims to create an environment that encourages people to grow as individuals and learn to bring about both small but continuous (Kaizen) and drastic or breakthrough improvements" (Dervitisiotis, 1998, p. 112). What differentiates TQM from reengineering is its focus on cultural empowerment and an attention to change in small and continuous increments. TQM interventions tend to fail when implemented, similar to reengineering, as top-down programs that assume neither an upward flow of involvement nor consensus decision-making (Hammer & Champy, 1993).

The role of management is key to understanding TQM. According to the TQM philosophy, most quality-related problems in the organization are caused by bad management and the systems that managers

create and operate (Deming, 1986; Lawler & Mohrman, 1998). Likewise, the power of management in fostering quality-driven cultures is in consonance with the organizational culture literature. This stream of study finds that management, in particular executive management, creates and maintains the cultural values of their organizations through the work models that they reward (Hansen & Kahnweiler, 1997; Schein, 1985; 1990).

Studies that have focused on the link between culture, work models, and TQM indicate that, in general, a participative, flexible, risk-taking, team-based, and quality driven organizational culture positively supports TQM efforts (Detert, Schroeder & Mauriel, 2000; Fiorelli & Feller, 1994; Kontoghiorghes & Dembeck, 2001). Thus, a company's prevailing cultural characteristics can inhibit or defeat a change effort before it begins. "Companies with a top-down management style, a short-term orientation that keeps them exclusively focused on quarterly results, and a bias against conflict may be uncomfortable challenging long-established rules" (Hammer & Champy, 1993, p. 207). Detert, Schroeder, and Muriel (2000) identified a set of eight specific value dimensions that appear to theoretically lead to quality cultures: Management should be based on facts; long-term planning and goal setting are preferable to a short-term orientation; the sources of problems should be searched for in processes—not in people; a premium is placed on change (as opposed to stability); the purpose of the organization is to achieve results that its stakeholders consider important; collaboration and cooperation are preferable to working alone; the vision, goals and responsibilities of the organization should be shared; success ought to be judged against external benchmarks.

Bianco, Nabors, and Roman (2002, p. 159) analyzed several sources of change management and uncovered a series of change variables that are cited as necessary for organizational change. All authors emphasize the need for a systems approach, utilizing multiple levers. According to Lance Berger (1998, p. 61),

> A "change ready" culture must be based on change responsive people, leadership, vision, risk taking, and optimism. Peter Senge (1999) claimed that you need the following: time, support, relevancy, assessment, strategy, purpose, governance, true believers, and walking the talk (p. 28). Bianco and Roman (1994) found that you need six drivers: leadership, infrastructure, training and communication, techniques and measurements, recognition and rewards, and customer and supplier focus (p. 29). Finally, Kotter (1995) outlined eight factors: establishing a sense of urgency, forming a powerful coalition, creating a vision, empowering others, creating short-term wins, consolidating improvements and producing still more change, and institutionalizing new approaches.

Meanwhile, Detert et al. (2000) call for more studies pertaining to organizational change and argue that this area has been inadequately explored. For instance, Olson and Eoyang (2002) state that over fifteen group methods can guide change in organizations. The authors further state that "this variety produces a kind of cacophony that defies integration and does not allow any one voice to stand out as a logical

alternative to the traditional explanations" (p. 6). Scholars and practitioners, on the whole, acknowledge the need for more research in organizational change. However, a recent review of the literature finds that the quality of data has advanced little in the past 25 years (Pettigrew, Woodman & Cameron, 2001). Pettigrew et al. characterize current knowledge as too anecdotal, containing few theoretical propositions and based on studies that are lacking in rigor. They call for a new pluralism between the social science and management scholars that entails a new dedication to time and history and a willingness to reveal the relationship between change processes and outcomes by portraying changes as continuous processes and not just detached episodes. The authors suggest that the literature is underdeveloped regarding these six interconnected analytical issues: multiple contexts or levels of analysis; time, history, process, and action; process linked to outcome; international comparative research; receptivity, customization, sequencing, and pacing; and scholarship linked to practice.

Purpose of Study

The main research questions for this study were as follows:

1. Which organizational variables incorporated in the study are highly associated with rapid change adaptation?
2. Which organizational variables incorporated in the study can serve as predictors of rapid change adaptation?
3. To what extent is rapid change adaptation associated with organizational performance?

To explore these research questions, an instrument was developed and administered in a health insurance service organization to identify, prioritize, and describe the most important work environment variables related to rapid change adaptation. Further, this study attempted to describe the association between rapid change adaptation and bottom-line organizational performance. The work environment was assessed by the following learning and organizational dimensions: learning climate; management practices; employee involvement; organizational structure; communication systems; reward systems; job design; job motivation; organization commitment; job satisfaction; innovation practices; technology management; teamwork climate; ethical work culture; and process improvement climate. Bottom-line organizational performance was defined by quality, productivity, innovation, and organizational competitiveness indicators. The dependent variable used for this study pertained to the extent to which the respondents believed their organization was able to adapt rapidly to introduced changes.

Many of the dimensions and indicators were assessed with scales that were described in previous literature (Buckingham & Coffman; 1999; Hackman & Oldham, 1980; Lindsay & Petrick, 1997; Macy & Izumi, 1993; Pasmore, 1988; Whitney & Pavett, 1998) or validated in previous studies (Kontoghiorghes, 2003a; Kontoghiorghes, 2003b; Kontoghiorghes, 2002; Kontoghiorghes, 2001a; Kontoghiorghes, 2001b; Kontoghiorghes & Dembeck, 2001; Kontoghiorghes, 1997). As far as the productivity and quality indicators are concerned, these consisted of validated items incorporated in previous studies (Kontoghiorghes, 2003a; Kontoghiorghes & Dembeck, 2001; Kontoghiorghes, 1997) as well as items that were derived from the quality

and productivity definitions reported by Lindsay and Petrick (1997) and Mohanty (1998). Organizational competitiveness reflected the extent to which the respondents perceived the organization to be competitive when compared to others. In all, the questionnaire attempted to determine the extent to which the organization was functioning as a high performance system and according to learning organization, TQM and STS theory and principles.

Methodology

Instrument. The instrument of this study consisted of a 108 Likert-item questionnaire, which was designed to assess the organization's earlier described dimensions. The instrument utilized a six-point scale that ranged from "strongly disagree" to "strongly agree." The first version of the questionnaire, which consisted of 99 Likert items, was originally pilot-tested on a group of 15 participants for clarity. Furthermore, a group of seven experts in the organization development, human resource development, or quality management areas reviewed the instrument for content validity. Upon revision, the instrument was then administered to a group of 129 members of five different organizations. Reliability tests were conducted and the instrument was further refined and expanded. As stated earlier, in its final format the instrument consisted of 108 Likert items. The reliability of the instrument was measured in terms of coefficient alpha and was found to be 0.98.

Subjects. The sampling frame of this study consisted of 256 employees of a large organization in the health care insurance industry. The instrument was administered in one division of the organization to determine the extent to which the division was functioning as a high-performance unit. Given that the division underwent numerous changes in recent years, such as restructuring, leadership changes, team development efforts, and introduction of new technologies, it was further determined that it could provide useful data on rapid change adaptation research. The employees were given the survey instrument at scheduled staff meetings over a period of two weeks. Of the 256 employees, 192 returned the survey yielding a response rate of 75%. Overall, 86.4% of the respondents were females and 13.6% males. Regarding positions held in the organization, 4.1% of the respondents were identified as either a vice-president or director of the unit, 4.1% as managers, 11.6% as supervisors, 65.7% as salaried professionals, 12.8% as administrative personnel, and 1.7% as hourly employees.

Data analysis. Based on the gathered data, a correlational analysis was used to describe the extent to which the organizational variables incorporated in the study are associated with rapid change adaptation. Further, through a stepwise regression analysis, the most important predictors of rapid change adaptation variable were identified. The generated regression model was cross-validated by calculating Herzberg's adjusted R^2 value and comparing it to R^2 in order to determine shrinkage and the predictive power of the regression model. A small amount of shrinkage, 12% or below (Stevens, 1986), will reflect a cross-validated predictive equation, capable of predicting well on an independent sample and thus having predictive power and general application. Given, however, that the data was gathered from a single source with a predominantly salaried female population, one should view the results of this study with caution.

The Results and Findings

Correlational analysis. In total, change adaptation was found to be positively and

significantly correlated with 99 of the other 107 variables incorporated in the questionnaire. These significant correlations ranged from 0.152 to 0.664 and reflected all learning, socio-technical, and quality management dimensions assessed by the instrument. This finding in essence validates the systemic nature of rapid change adaptation and thus its reliance on multiple organizational dimensions for successful implementation. Given the large number of significant correlations and the fact that the main purpose of this study was to identify the stronger predictors of change adaptation, only those that were found to be 0.4 or higher are listed in Table 1.

As shown in Table 1, rapid change adaptation was found to be moderately to highly associated with 29 organizational variables, which in turn represented the socio-technical, quality management, and learning environment dimensions. A closer look at Table 1 will reveal that most organizational variables represent the socio-technical and quality management dimensions and range from 0.400 to 0.63. It is worth noting that none of the training transfer climate variables were found to be highly associated with rapid change adaptation. This finding suggests that successful change interventions depend more on the design, operational, and cultural characteristics of the organization rather than the skill level and expertise of the workforce.

Regarding the socio-technical variables, the correlational data in Table 1 reveal that change adaptation will be more likely to occur on a rapid basis if introduced in a participative and non-bureaucratic *work environment* within which there is constant communication and no boundary interference between departments. Other work environment variables that were found to be moderately to highly associated with change adaptation were strong organizational commitment toward the employees ($\underline{r} = 0.46$; $\underline{p} < 0.01$); encouragement by the organization to have a healthy balance between work and life obligations ($\underline{r} = 0.45$, $\underline{p} < 0.01$); and the extent to which the organization is characterized by high ethical standards ($\underline{r} = 0.44$, $\underline{p} < 0.001$). Collectively, these work environment variables describe a non-bureaucratic and ethically driven system, which promotes employee involvement and well-being.

With regard to the *job and team environment*, change adaptation was found to be more highly associated with a high performance team environment within which team members are deeply committed to one another's personal growth and success ($\underline{r} = 0.48$, $\underline{p} < 0.01$); are willing to put in effort above the minimum required in order to help the organization succeed ($\underline{r} = 0.44$, $\underline{p} < 0.01$); and have personal influence over their own work ($\underline{r} = 0.42$, $\underline{p} < 0.001$). In other words, rapid change adaptation is more likely to occur in a true team environment within which employees are deeply committed to the success of the organization and each other and enjoy autonomy on how to perform their jobs. These results demonstrate the importance of designing organizations that promote employee commitment and teamwork. Hence, paying close attention to the needs of the social system is still very important when rapid change adaptation is a desired outcome.

As far as the dimensions dealing with *innovation, technology, and rewards* are concerned, the correlations in Table 1 make it apparent that rapid change adaptation is more likely to occur in an innovation-driven system within which risk-taking not only is not

Table 1. Pearson Correlations of Rapid Change Adaptation with Organizational Variables (r > 0.4)

Variable	Change Adaptation
SOCIOTECHNICAL SYSTEM VARIABLES	
Work Environment	
Participative organization	r = .60**
No boundary interference between departments to solve joint problems	r = .52**
Few bureaucratic barriers to get job done	r = .48**
Constant communication between departments	r = .48**
Strong organizational commitment to employees	r = .46**
Organization encourages healthy balance between work and life obligations	r = .45**
People live up to high ethical standards	r = .44**
Job and Team Environment	
Deeply committed to one another's success	r = .48**
People willing to put in effort above minimum required	r = .44**
Personal influence over work	r = .42**
Innovation, Technology, and Rewards	
Few restrictions to innovation	r = .59**
Risk taking is expected	r = .51**
Risk taking not punished	r = .50**
New ideas rewarded	r = .50**
New ideas are constantly sought	r = .49**
Rapid technology assimilation	r = .56**
Frequent technology introduction	r = .47**
Technology primary support in quality efforts	r = .43**
Profit sharing	r = .48**
QUALITY MANAGEMENT VARIABLES	
Structure of organization facilitates focus on process improvement	r = .63**
Internal customer focus	r = .55**
Quality measurement	r = .52**
Excellence commitment	r = .52**
Emphasis on doing things right the first time	r = .45**
Quality improvement primary focus	r = .41**
Quality improvement is a high strategic priority	r = .41**
LEARNING ENVIROMENT VARIABLES	
Employee commitment to continuous learning	r = .50**
Learning is well rewarded	r = .40**
Sharing of knowledge and expertise with others	r = .40**

**Correlation is significant at the 0.01 level (2-tailed). Listwise N=159

punished, but is indeed expected. Moreover, within such an environment new ideas are constantly sought and rewarded. This kind of work environment is in direct contrast to the bureaucratic model of management, which advocates strict adherence to rules and regulations, and the punishment, or expulsion of those who challenge them. It is not by accident then that bureaucratic organizations have such a hard time coping with today's rapidly changing times and often rely on drastic reengineering efforts in order to address their numerous stagnation-related problems.

The data in Table 1 also suggest that rapid change adaptation is highly associated with rapid technology assimilation ($\underline{r} = 0.56$, $\underline{p} < 0.01$), frequent technology introduction ($\underline{r} = 0.47$, $\underline{p} < 0.01$), and the use of technology as a primary support in the organization's quality efforts ($\underline{r} = 0.43$, $\underline{p} < 0.01$). This finding is not surprising, given that the more rapidly the organization introduces and assimilates technologies the more rapidly it adapts to the related changes. Another implication of this finding pertains to the validation of the importance of socio-technical systems theory. More specifically, the findings described in this

technology-related section in conjunction with those pertaining to the need for a highly participative, committed, and team-oriented social system, demonstrate that organizational renewal and success do indeed depend on the optimization of both subsystems, the social and the technical. This finding is important in the sense that it reinforces the fundamental premise of STS theory, which is "joint optimization" of both subsystems. It also highlights the importance of systemic solutions when it comes to creating flexible and adaptive systems.

Regarding rewards, rewarding new ideas ($\underline{r}$ = 0.50, $\underline{p} < 0.01$), profit sharing ($\underline{r}$ = 0.48, $\underline{p} <$ 0.01) as well as rewards for learning ($\underline{r}$ = 0.40, $\underline{p} < 0.01$) were found to be positively and significantly correlated with rapid change adaptation. This finding suggests that when the employees believe that positive organizational outcomes will result in personal gains, then the employees will be more motivated to adopt the introduced changes. The positive association between rewards for learning and rapid change adaptation indicates that a reward system that is also based on pay for skills and knowledge does indeed offer the organization an advantage when it comes to change adaptation.

However, given the high correlation between rewards for new ideas and change adaptation, special attention should be paid to rewards for the new ideas component. This is a very powerful mechanism that has been extensively and very successfully used by the Toyota Motor Corporation, a benchmark company in the manufacturing industry. Such a reward system does not only result in rapid change adaptation but in quality and cost reduction improvements as well.

The effectiveness of a system that rewards employees for new ideas is exemplified by the fact that in the year of 2000 employees at the Toyota plant in Georgetown, Kentucky, provided the organization with more than 70,000 new ideas. The payout for these ideas was about $3 million. The payoff was that the instituted changes saved the organization $28 million (Toyota Information Seminar, 2001). It is important to note that aside from the gains stemming from improvements, rewarding new ideas assists the organization in creating a more participative system, which, as was found by this study, is also highly associated with rapid change adaptation ($\underline{r}$ = 0.60, $\underline{p} < 0.01$). Lastly, another very important outcome of such a rewards system is that the change process itself is owned by those who actually implement the changes. This ownership is critical to the successful introduction of change interventions.

With regard to quality management (QM), the correlations in Table 1 indicate that rapid change adaptation is highly associated with a quality-driven culture. As shown, the correlation between change adaptation and the extent to which the structure of the organization facilitates focus on process improvement ($\underline{r}$ = 0.63, $\underline{p} < 0.01$) was by far the highest in the table. Other QM variables that were found to exhibit a Pearson correlation of 0.40 or higher were internal customer focus ($\underline{r}$ = 0.55, $\underline{p} < 0.01$); quality measurement ($\underline{r}$ = 0.52, $\underline{p} < 0.01$); excellence commitment ($\underline{r}$ = 0.52, $\underline{p} < 0.01$); emphasis on doing things right the first time ($\underline{r}$ = 0.45, $\underline{p} < 0.01$); the extent to which quality improvement is a primary focus for the organization ($\underline{r}$ = 0.41, $\underline{p} < 0.01$); and the extent to which quality improvement is a high strategic priority ($\underline{r}$ = 0.41, $\underline{p} < 0.01$).

The last variables to be discussed under the correlational analysis are those associated with the learning environment. A close look at the learning-related variables in Table 1 will reveal that rapid change adaptation will be more likely to occur in an environment within which employees are committed to continuous learning ($r = 0.50$, $p < 0.01$), are rewarded for their learning ($r = 0.40$, $p < 0.01$), and share their knowledge and expertise with others ($r = 0.40$, $p < 0.01$). Collectively, these three variables demonstrate that a continuous learning culture can indeed act as a catalyst to organizational change and renewal.

Stepwise regression analysis. The results of the stepwise regression analysis of the change adaptation variable are summarized in Tables 2 and 3. As shown in Table 2, the produced regression model accounted for 59.5% of the total variance of the dependent variable and incorporated 11 independent variables in its design. At 4.0%, shrinkage of the R^2 value can be considered very small and thus reflecting a cross-validated regression model with predictive power.

Accounting for 38.9% of the total variance, the strongest predictor of change adaptation was the variable pertaining to the extent to which the structure of the organization facilitates focus on process improvement. The second and third predictors selected by the regression model, which accounted for 6.2% and 3.7% of the total variance respectively, were rapid technology assimilation and internal customer focus. The remaining predictors selected by the regression model were (a) profit sharing; (b) awareness of how work unit processes fit with those of the other work units; (c) few restrictions to innovation; (d) product/service quality that is measured at every step of the way; (e) supervisory feedback on performance; (f) personal influence over one's work; (g) decisions on quality improvement that are based on objective data; and, (h) the willingness of people in the organization to put in effort above the minimum required.

Association of rapid change adaptation and organizational performance. As shown in Table 4, rapid change adaptation was found to be highly associated with indicators of all performance dimensions assessed by the instrument. More specifically, the 13 Pearson correlations in Table 4 range from 0.420 to 0.664 and reflect the productivity, quality, innovation, and competitiveness dimensions. Special attention should be given to the high correlations pertaining to quick product/service introduction ($r = 0.664$, $p < 0.001$); cost effective production ($r = 0.574$, $p < 0.001$); internal process satisfaction ($r = 0.562$, $p < 0.001$); and competitiveness ($r = 0.488$, $p < 0.001$). In essence, these correlations exemplify the importance of this study and demonstrate how critical rapid change adaptation is in today's very competitive environments. Simply put, the organization that is able to adapt to changes very rapidly will be the one that will be able to bring new products and/or services to market quicker, be more competitive, and outperform its competitors in productivity and quality.

Summary and Conclusions

In short, the correlational analysis of this study found rapid change adaptation to exhibit a correlation of 0.5 or higher with the following organizational variables: participative organization; the extent to which there is no boundary interference between departments to solve joint problems; few restrictions to innovation; the extent to which risk-taking is expected; the extent to which risk-taking is not punished; the extent to which new ideas are

Table 2. Stepwise Regression Model of Rapid Change Adaptation[a,b,c]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1 Structure of organization facilitates focus on process improvement	.626	.392	.389	1.09
2 Rapid technology assimilation	.674	.454	.447	1.03
3 Internal customer focus	.700	.491	.482	1.00
4 Profit sharing	.714	.510	.499	0.98
5 Awareness of how work unit processes fit with those of other work units	.730	.533	.519	0.96
6 Few restrictions to innovation	.744	.554	.538	0.94
7 Quality is measured at every step of the process	.755	.571	.553	0.93
8 Receive supervisory feedback on performance	.764	.583	.564	0.92
9 Personal influence over my work	.773	.597	.575	0.91
10 Quality improvement is based on objective data	.781	.610	.587	0.89
11 People willing to put in effort above minimum required	.787	.620	.595	0.88

[a]. Dependent Variable:Rapid change adaptation; N = 176
[b]. Method: Stepwise (Criteria: Probability-of-F-to-enter <= .050, Probability-of-F-to-remove >= .100).
[c]. F = 24.46, p < 0.001

Table 3. Beta Coefficients for Rapid Change Adaptation Regression Model

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.076	.306		-.248	.804
1 Structure of organization facilitates focus on process improvement	.202	.079	.191	2.550	.012
2 Rapid technology assimilation	.166	.066	.169	2.493	.014
3 Internal customer focus	.144	.066	.143	2.181	.031
4 Profit sharing	.215	.062	.209	3.498	.001
5 Awareness of how work unit processes fit with those of other work units	.182	.061	-.171	-2.981	.003
6 Few restrictions to innovation	.261	.071	.238	3.606	.000
7 Quality is measured at every step of the process	.182	.069	.175	2.637	.009
8 Receive supervisory feedback on performance	.131	.050	.149	2.634	.009
9 Personal influence over my work	.135	.054	.140	2.482	.014
10 Quality improvement is based on objective data	.147	.060	.143	2.445	.016
11 People willing to put in effort above minimum required	.127	.061	.116	2.071	.040

rewarded; quality measurement; the extent to which the organization is committed to excellence; and, the extent to which the employees of the organization are committed to continuous learning. At the same time, the stepwise regression model identified the following variables to be the most important predictors of rapid change adaptation: the extent to which the structure of the organization facilitates focus on process improvement; rapid technology assimilation; internal customer focus; and profit sharing.

Collectively the correlational data and the independent variables in the regression model suggest that rapid change adaptation may be more likely to occur in an organizational setting within which there is an emphasis on process and quality improvement, employee participation, rapid technology assimilation, innovation, and internal customer focus. Within such a participative system, quality is measured at every step of the process, there are few restrictions to innovation, and the organization shares its profits with the employees. Furthermore, within such a system, risk-taking is not punished—it is expected. New ideas are constantly sought and rewarded while employees enjoy task autonomy, put in effort above the minimum required, are genuinely committed to each other's success and growth, and receive supervisory feedback on their performance.

Overall, the findings of this study highlight the importance of STS theory and demonstrate that rapid change adaptation is more likely to occur in an optimized socio-technical system for which employee involvement, commitment, and empowerment are of great importance. Given the high correlations between several TQM variables and rapid change adaptation, one can further conclude that rapid change adaptation is significantly facilitated by an environment for which quality, excellence, and continuous improvement are strategic priorities. This can be considered an important finding because, as of late, some have questioned the

Table 4. Pearson Correlations of Rapid Change Adaptation With Performance Indicators (r > 0.4)

Performance Indicator	Rapid Change Adaptation
Productivity	
Cost effective production	$r = .574^{**}$
Peer output timely	$r = .479^{**}$
Quality	
Internal process satisfaction	$r = .562^{**}$
On-time delivery of products/services	$r = .537^{**}$
Employees react quickly to unexpected problems	$r = .533^{**}$
Products/Services produced meet specifications	$r = .510^{**}$
No change or rework needed after final product is produced	$r = .473^{**}$
External customer satisfaction	$r = .431^{**}$
Peer output accurate	$r = .425^{**}$
Peer output complete	$r = .420^{**}$
Innovation	
Quick product/services introduction	$r = .664^{**}$
Innovative organization	$r = .557^{**}$
Competitiveness	
Competitive organization	$r = .488^{**}$

**Correlation is significant at the 0.01 level (2-tailed). Listwise N=159

effectiveness of total quality management in today's rapidly changing world. The new argument is that organizations need large and drastic changes in order to cope with today's fast changing external environments. Thus, advocates of the reengineering approach claim that TQM, which relies on small but continuous changes, cannot be an effective approach to drastic changes. The results of this study suggest otherwise. In general, companies that function under a continuous improvement mode do not need to make drastic changes to cope with the demands of the external environment. In fact, it is frequently the continuously improving companies that make it necessary for the competition to implement drastic changes in order to bridge the corresponding performance gap. Hence, the results of this study further suggest that unless reengineering efforts are accompanied by cultural changes that transform the organization into an innovative, participative, and quality-driven entity, the organization will still find itself having difficulty adapting to changes in a rapid manner and thus being subjected to periodic and unproductive drastic changes. Finally, as the data in Table 4 indicate, organizations that are successful in creating such a culture will be able to introduce and adapt to change rapidly and will most likely enjoy a competitive advantage through new product/service introduction, quality performance, and productivity.

Implications for Practice

This study has significance for OD practitioners who serve as change agents. In this capacity, they must foster a philosophy of open systems where transformation considers both the social as well as the technical side of change. By helping organizations embrace the socio-technical doctrine, they enhance their ability to foster the predictors of rapid change adaptation identified in this study. Key to an organization's readiness and willingness to accept the quality of this perspective is their organizational culture.

Cultural norms are deep, difficult to see and for most, impossible to articulate. It is the role of OD, given the field's philosophical commitment to people and people-focused management, to uncover and provide guidance in interpreting these belief systems. In particular, help is needed to understand how an organization's culture supports or hinders the principles of total quality management and continuous improvement. Given serious support from top management, OD practitioners can work with individuals to reshape inappropriate reward structures, managerial practices, and work models. By transforming these factors, a culture of excellence, synergy, and innovation can emerge through new systems designed to favor employee empowerment, teamwork, and openness to continuous learning. In short, the social rules can and must change. Without a supportive culture, the potential for effective and rapid adaptation declines dramatically, as the organization becomes a candidate for yet another failed reengineering attempt where there is little or no sustainable impact to bottom-line performance.

A change-ready culture is one that encourages employees' psychological ownership in the outcome of change. A growing body of literature characterizes the psychological aspect of ownership as different and perhaps even more powerful than financial ownership (Pierce, Rubenfeld & Morgan, 1991). This area of study suggests that financial ownership alone cannot influence the kind of behavior needed to break the cycle of compliance and apathy that often provokes the need for organizational change. Pierce et al. describe

psychological ownership as occurring when employees possess meaningful equity in their organization, have access to pertinent information about the company's strategic plans, and participate in decision-making and management. We believe that the principles of psychological ownership complement the learning, socio-technical and quality management dimensions that emerged in this study as key to rapid change adaptation.

Meaningful equity. Compensation, promotion, and hiring practices must be linked to objective performance criteria. This linkage should decrease unproductive labor by reducing the ambiguity in present reward and feedback systems. Meanwhile, the issue of nepotism or political connections cannot be ignored, as it is a natural extension of those organizational cultures that require the nurturing and care of favored members. Perhaps the initial focus should not be its elimination, but on control of the process in a way that limits opportunity and equity to those who are not competent performers. Shareholding also should be democratized. The use of stock ownership plans and profit sharing would give the majority of people, in all social ranks and ethnic backgrounds, the chance to share the benefits of greater productivity and accumulation, thereby enlarging the circle of those in a position to profit directly.

Transparency and access to information. Most employees have a thirst to know, to be kept current. However, transparency and access to communication can often be constrained by layers of bureaucracy. An "open door" policy should be practiced and top management should meet often with employees to explain strategic policy and the need for change. This point will support the socio-technical variables in this study that call for a participative and non-bureaucratic work environment where communication can flourish between levels and departments.

Supple and participative management. Decentralization and flatter managerial structures will additionally permit employee participation and greater flexibility in management styles. A supple environment is needed to respond not only to external personal obligations but also to promote innovation through a greater permission to learn from one's mistakes. A culture that promotes a learning environment might place greater emphasis on improved processes than on outcomes while advocating a staged approach to change that is less risky for the individual. Such cultures encourage and expect innovation. Likewise, an innovation-driven system promotes an environment in which issues can be settled by arbitration rather than rules and is consonant with empowerment governance and teamwork.

Future Research

As stated earlier, the main limitation of this study is that the data was collected from a single source with a predominantly salaried female population in the health care insurance industry. Hence, replicating this study in other industries and organizations will help determine the extent to which the presented results can be generalized to other settings and populations. In particular, gathering more empirical data from several organizations, some of which could be undergoing change or constantly remaining in a static stage, could help further explain the change adaptation phenomenon.

References

Barney, & Hansen, C. (1994). Trustworthiness as a source of competitive advantage. *Strategic Management Journal, 15*, 175-190.

Bianco-Mathis, V. E., Nabors, L. K., & Roman, C. H. (2002) *Leading from the inside out*: *A coaching model*. Thousand Oaks, CA: Sage.

Bigley, G., & Pearce, J. (1998). Straining for shared meaning in organization science: Problems of trust and distrust. *Academy of Management Review, 23*(3), 405-421.

Buckingham, M., & Coffman, C. (1999). *First break all the rules: What the world's greatest managers do differently*. New York: Simon & Schuster.

Blumer, H. (1969). *Symbolic interaction: Perspective and method*. Englewood Cliffs, NJ: Prentice-Hall.

Burke, W. W. (1994). *Organizational development*, 2nd Ed. Reading, MA: Addison-Wesley.

Das, T. K., & Teng, B. (1998). Between trust and control: Developing confidence in partner cooperation in alliances. *The Academy of Management Review, 23*(3), 491-512.

Deming, E. (1986). *Out of the crisis*. Cambridge, MA: Massachusetts Institute of Technology, Center of Advanced Engineering Study.

Dervitsiotis, K. (1998). The challenge of managing organizational change: Exploring the relationship or reengineering, developing learning organizations and total quality management. *Total Quality Management, 9*(1) 109-122.

Detert, J. R., Schroeder, R. G., & Mauriel, J .J. (2000). A framework for linking culture and improvement initiatives in organizations. *The Academy of Management Review, 25*(4), 850-863.

Ellis, S. (1998). A new role of the post office: An investigation into issues behind strategic change at Royal Mail. *Total Quality Management, 9*(2/3), 223-234.

Felkins, P., Chakiris, B.J., & Chakiris K. N. (1993). *Change management: A model for effective organizational performance*. White Plains, NY: Quality Resources.

Fiorelli, J. & Feller, R. (1994). Re-engineering TQM and work redesign: An integrative approach to continuous organizational excellence. *Public Administration Quarterly, 18*(1), 54-64.

French W., & Bell. C. (1999). *Organizational development: Behavioral science interventions for organization improvement* (6th ed.) Upper Saddle River, NJ: Prentice Hall.

Fukuyama, F. (1995). *Trust: The social virtues and the creation of prosperity*. New York: The Free Press.

Hackman, J. R., & Oldham, G.R. (1980). *Work redesign.* Reading, MA: Addison-Wesley.

Hammer, M., & Champy, J. (1993). *Reengineering the corporation: A manifesto for business revolution.* New York: HarperCollins.

Hansen, C. D., & Kahnweiler, W. M. (1997). Executive managers: Cultural expectations through stories about work. *Journal of Applied Management Studies, 6*(2), 117-138.

Harvey, D., & Brown, D. (2001). *An experiential approach to organizational development* (6th ed.) Upper Saddle River, NJ: Prentice-Hall.

Hofstede, G. (1980). *Cultures consequences: International differences in work related values*. Newbury Park, CA: Sage.

Jones, G., & George, J. (1998). The experience and evolution of trust: Implications for cooperation and teamwork. *The Academy of Management Review, 23*(3), 531-546.

Kilmann, R. H. (1989). *Managing beyond the quick fix.* San Francisco, CA: Jossey-Bass.

Kontoghiorghes, C. (2003a). Examining the association between quality and productivity performance in a service organization. *Quality Management Journal, 10*(1), 32-42.

Kontoghiorghes, C. (2003b). Identification of key predictors of organizational competitiveness in a service organization. *Organization Development Journal, 21*(2), 28-42.

Kontoghiorghes, C. (2002). Predicting motivation to learn and motivation to transfer learning back to the job in a service organization—A new systemic model for training effectiveness. *Performance Improvement Quarterly, 15*(3), 114-129.

Kontoghiorghes, C. (2001a). Factors affecting training effectiveness in the context of the introduction of new technology—a U.S.

case study. *International Journal of Training and Development, 5*(4), 248-260.

Kontoghiorghes, C. (2001b). A holistic approach toward motivation to learn in the workplace. *Performance Improvement Quarterly, 14*(4), 3-17.

Kontoghiorghes, C., & Dembeck, D. (2001). Prioritizing quality management and socio-technical variables in terms of quality performance. *Quality Management Journal, 8*(3), 36-48.

Lawler III, E., & Mohrman, S. (1998). Employee involvement, reengineering, and TQM: Focusing on capability development. In S. Mohrman, J. Galbraith, E. Lawler III, & Associated, *Tomorrow's organization—Crafting winning capabilities in a dynamic world* (pp. 179-207). San Francisco: Jossey-Bass.

Lewin, K. (1951). *Field theory in social science*. New York, NY: Harper.

Lewin, J., & Johnson, W. (2000). The impact of downsizing and restructuring on organizational competitiveness. *Competitiveness Review, 10*(1), 45-55.

Lindsay, M., & Petrick, J.A. (1997). *Total quality and organization development*. Boca Raton, FL: St. Lucie Press.

Lundberg, C. (1999). Organizational development as facilitating the surfacing and modification of social rules. In Eds. Pasmore, W. & Woodman, R. *Research in Organizational Change and Development*. Stamford, CN: JAI Press.

Macy, B.A., & Izumi, H. (1993). Organizational change, design, and work innovation: A metaanalysis of 131 North American field studies 19611991. *Research in Organizational Change and Development, 7*, 235313.

Martin, J. (1982). Stories and scripts in organizational settings. In A.H. Hastorf & A. M. Isen (Eds.). *Cognitive social psychology* (pp. 235-305). New York, NY: Elsevier.

Mayer, R. C., Davis, J. H., & Schoorman, F.D. (1995). An integrative model of organizational trust. *Academy of Management Review, 20*, 709-734.

McAllister, D. J. (1995). Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of Management Journal, 38*, 24-59.

Mohanty, R.P. (1998). Understanding the integrated linkage: Quality and productivity. *Total Quality Management, 9*(8), 753-765.

Oden, H. (1999). *Transforming the organization: A social-technical approach*. Westport, CT: Quarum Books.

Olson, E. & Eoyang, G. (2002). Facilitating organization change: Lessons from complexity science. *Quality Progress, 35*(6), 112-114.

Organ, D. W., & Ryan, K. (1995). A meta-analytic review of attitudinal and dispositional predictors of organizational citizenship behavior. *Personnel Psychology, 48*, 775-802.

Orlikowski, W. J. (1996) Improvising organizational transformation over time: A situated change perspective. *Information Systems Research, 7,* 63-92.

Pasmore, A.W. (1988). *Designing effective organizations: The Sociotechnical systems perspective*. New York: NY: Wiley & Sons.

Porras, J. I., & Robertson, P. J. (1992) Organizational development: Theory, practice, and research. In M.D. Dunnette and L.M. Hough (Eds.) *Handbook of industrial and organizational psychology*, (2ed.) pp 719-822, Palo Alto, CA: Consulting Psychologists Press.

Pettigrew, A.M., Woodman, R. W., & Cameron, K.S. (2000). Studying organizational change and development: Challenges for future research. *Academy of Management Journal, 44*(4), 697-713.

Pierce, J., Rubenfeld, S., & Morgan, S. (1991). Employee ownership: A conceptual model of process and effects. *Academy of Management Review, 16*(1), 121-44.

Rousseau, D., Sitkin, S. Burt, R., & Camerer, C. (1998). Not so different after all: A cross-discipline view of trust. *Academy of Management Review, 23*(3), 393-404.

Spradley, J. (1979). *The ethnographic interview*. New York: Holt, Rinehart, & Winston.

Schein, E. H. (1985). *Organizational culture and leadership*. San Francisco, CA: Jossey-Bass.

Schein, E. H. (1990). Organizational culture. *American Psychologist, 45*, 109-119.

Stevens, J. (1986). *Applied multivariate statistics for the social sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Toyota Information Seminar (August, 2001). Georgetown, KY.

Trice, H., & Beyer, J. (1993). *The cultures of work organizations*. Englewood Cliffs, NJ: Prentice Hall.

Van Dyne, L., Cummings, L. L., & Parks, J. M. (1995). Extra-role behaviors: In pursuit of construct and definitional clarity. In B. M. Staw & L.L. Cummings (Eds.) *Research in organizational behavior, 17*, 215-285. Greenwich, CT: JAI Press.

Whitney, G., & Pavett, C. (1998). Total quality management as an organizational change: Predictors of successful implementation. *Quality Management Journal, 5*(4), 922.