What do IT Specialists Know about Managing Change?

Abstract

This study is part of a larger research program on IT change agentry. The primary intent of the present study was to determine the degree of knowledge and understanding that IT specialists have regarding fundamental concepts in the management of change in organizations. Data were collected using a survey instrument, the Managing Change Questionnaire, which was mailed to over 2,200 IT specialists in Quebec. Of the sample, 18% returned completed questionnaires. ANOVA and t-test were used to identify differences among categories of respondents. Overall, IT specialists are missing the mark and have insufficient knowledge of some key change management issues. As anticipated, senior IT managers and systems/business analysts demonstrated a better grasp of many of the issues inherent in organizational change efforts than did technical personnel. Implications of these results are briefly discussed.

Introduction

The IT world is changing at an incredible rate. The profession is experiencing a paradigm shift which requires adjustments and creates new opportunities for IT professionals. In the old IT world, computer applications were developed and controlled by IT specialists for the benefit of others in the organization (Farewell et al. 1992). Consequently, it was assumed that systems professionals would possess all the requisite knowledge for designing and implementing effective information systems (Todd et al. 1995). In short, under the old paradigm, the IT department could be viewed as a “creator of products” and the tasks performed revolved around the development and maintenance of generally large-scale, structured, and usually rigid information systems (Farewell et al. 1992). In the new IT world, the demands on the profession are significantly different. Several fundamental changes have been occurring in the business computing environment. First, the emphasis has shifted from make to buy, and buy can occur in several forms (Morello 1998). Off-the-shelf software can be purchased directly, applications can be outsourced to development firms, or system shells for spreadsheet or data base applications can be purchased for users to assist in the development of their own systems. Second, as users’ understanding of what technology can deliver increases, they are demanding for more power in determining their own computerized objectives (Mingay et al. 1998; Magee et al. 1997). Last, and most importantly, organizations are experiencing multiple attempts at radical transformation (Venkatraman 1994; Rivard et al. 2004), often linked to the redesign of business processes and the introduction of emerging technologies such as ERP and CRM systems.

These changes create new expectations about the roles of IT professionals within organizations. In this regard, the in-house portfolio of IT-related skills is shifting from an emphasis on technical skills to an emphasis on business and IT management skills (Morello 1998). The proposition that future IT professionals will have to function more like change agents has been echoed by a number of researchers (e.g., Fougere 1991; Ross 1992; Klenke 1993; Markus and Benjamin 1996; Clark et al. 1997; Winston 1999; Kakabadse and Korac-Kakabadse 2001). In an article entitled “The Future Role of the Systems Analyst as a Change Agent”, Fougere (1991) argues that a new paradigm for the systems analyst has to be developed in order
to ensure the completion of successful IT projects. In his view, some of the specific activities systems analysts must accomplish as effective change agents include: developing the need for change by helping users to recognize problems and convince them that they can effect change; reinforcing users’ acceptance of the innovation by providing evaluation information; and encouraging users to assume responsibility for the innovation.

In the same vein, Markus and Benjamin (1996) posit that IT specialists generally need to become better agents of organizational change for three primary reasons. First, a vast body of scientific literature shows that how a system is implemented is a major factor in the results organizations achieve from new IT (e.g., Benjamin and Levinson 1993; McKeen and Guimaraes 1997; Smith 1999, 2000). Yet, despite our vast knowledge of this dynamic, many organizations continue to experience considerable problems in IT implementation efforts. Indeed, many IT-based organizational change initiatives, even those undertaken by organizations with the best intentions, are often destined for failure at some point in their implementation (Hunter 1999; Haughton 2003). IT project failures can be traced in hindsight to a number of factors, including inappropriately conceived future states, resistance by organizational members, lack of project champion, faulty implementation strategies during transition periods, or simply a lack of knowledge regarding important aspects of change management on the part of implementation team members (Beath 1991; Robey and Rodriguez-Diaz 1989; Orlikowski and Hofman 1997; Lapointe and Rivard 2002).

Second, transaction cost considerations suggest that IT work that does not require organizational loyalty and/or specialized organizational skill (e.g., technical work) will be outsourced. It was estimated that only 10% of computer-based applications would be developed by the traditional IT-based development staff by 2003 (Morello 1998). Conversely, transaction cost theory predicts that any IT work where organizational loyalty and insider knowledge of the organization are essential (e.g., IT implementation and change management), will be less vulnerable to outsourcing. Third, Markus and Benjamin posit that becoming better change agents is bound to improve IT specialists’ credibility. Many people think the IT organization in general has a poor record of project completion, a weak reputation for IT service quality and a weak profile of leaders, managers and change agents (Morello 1998) and several organizations have experienced a crisis of confidence in there IT functions (Earl and Feeny 1994).

In short, it is difficult to imagine today any IT effort that does not fundamentally involve change at some level, whether such change is focused on a single individual, work group, or the entire organizational culture. Several emerging applications fundamentally alter the way a group of people operate, both as individuals and as a whole, and the way they relate to suppliers, customers and one another will create a lot of anxiety (Goff 2000). Under such circumstances, we concur with Fougere (1991) and Markus and Benjamin (1996) that IT specialists are in the right position to facilitate organizational change. However, if they do not properly understand change they cannot be effective in helping others through this often difficult and arduous process. Managing change is defined here as “an understanding of the personal and organizational dynamics involved in a change effort, accompanied by the ability to lead people through one successfully” (Burke et al. 1991:87).

As of today there has been no prior empirical research that explicitly measured the degree of knowledge and understanding that IT specialists have regarding key issues in the management of change in organizations. This study offers to fill that gap. Several years ago, the Managing Change model (Burke 1988; Burke and Spencer 1990; Burke et al. 1993) was used as a framework to measure knowledge about issues in organizational change among managers and executives (Burke et al. 1991) and, more recently, among organizational development (OD)
practitioners (Church et al. 1996). These studies yielded some interesting results about contemporary managers’ and OD specialists’ understanding of change. The present study intends to compare IT specialists’ understanding of change management issues to that of managers and OD practitioners.

**Literature Review**

There are a number of theoretical perspectives from which managers and IT specialists can currently draw their knowledge about the process of change in organizations. The following presentation will focus on process-oriented change models which address changing organizations’ cultural and human systems using techniques grounded in theories from the behavioural sciences. This perspective is distinct from the strategic planning models (e.g., Dunphy and Stace 1993) that are frequently the focus of many change interventions in organizations. It is the case, more often than not, that effective and successful organizational transformation incorporates and manages both these perspectives concurrently (Champy 1995; Rivard et al. 2004). The present literature review will focus on three important process-oriented perspectives, which exemplify significantly different conceptualizations of how change affects organizations: (1) that change is characterized by certain patterns that affect organizations similarly; (2) that organizations are challenged to preserve their identities throughout a transition; and (3) that change impacts the individuals within an organization more fundamentally than it does the organization as a whole. Each of these perspectives is briefly described below.

(1) **Patterns in the change process**

Traditionally, change has been seen as a relatively static entity in organizations (Lewin 1958). Change usually starts with a high level task force that determines what changes need to be made. The task force then announces what will be done and appoints project teams to implement the different elements involved. From here, each team follows a series of sequential steps for envisioning, planning, implementing, consolidating, and institutionalizing their particular change component. In other words, change has been managed in a mechanistic fashion – broken down into its component items, plotted out over the expected time it will take, and managed in pieces.

However, not all business transformations can be anticipated and planned in this fashion. In fact, many of the difficulties of managing change arise when companies only plan for and manage anticipated change. This increases the complexity of change because they don't recognize the unanticipated changes that always occur and are, thus, unprepared to deal effectively with them (Orlikowski and Hoffman 1997). A more realistic approach to change recognizes both types of changes – anticipated and unanticipated. For example, a new technology could initially lead to an anticipated change in staffing levels while other changes in the psychological or social dimensions of the jobs can remain hidden to take time to become visible. Thus, a company’s planning for a change may be limited to its immediately anticipated impacts, while its more powerful impacts remain hidden, leading managers to overlook key aspects of the change that can cause problems. The discrepancy between the anticipated impact of a change and how it actually affects organizations contributes significantly to the difficulties businesses face as they attempt to introduce change effectively.

Today, managers are beginning to realize that, because of the difficulty of predicting the organizational impacts of change, a mechanistic model may not be the most effective change management approach to use (Yetton et al. 1994). An *improvisational model* of change management may, therefore, be a better way of viewing business reinvention or transformation because it takes into consideration the fact that change is an ongoing process, rather than a
discrete event (Orlikowski and Hoffman 1997). This model recognizes that only anticipated change can be planned. Emergent and opportunity-based changes require a response. Thus, the model sees change not as a predefined program charted by management ahead of time, but as an iterative sequence of plans and responses. Through it, "rather than predefining each step and then controlling events to fit the plan, management creates an environment that facilitates improvisation... and supports and nurtures the expectations, norms, and resources that guide the ongoing change process" (Orlikowski and Hoffman 1997:20). The ability to view change dynamically provides an organization with an approach to understand and better manage its realities in the modern organization.

(2) Challenges to organizational identity

Beckhard and Harris (1987) focus on the significance of the transition state through which members of an organization must navigate in order to evolve from its “present state” to its “desired future state.” Most companies identify a specific person or group of people to be responsible for achieving change. For most changes, particularly large-scale ones, a transition management team is recommended (Beckhard and Harris 1987; Duck 1993). The role of the team is to oversee the corporate change effort and make sure that all parts of the change fit together. It acts as a change catalyst and works cross-functionally to manage and guide the change process. Reporting to the CEO, the team should be on the job until the change process has stabilized, at which point it disbands. It is usually composed of leaders who are respected by the organization and have wisdom, objectivity and effective interpersonal skills. This team must also have the resources and clout to manage the change process. For large transformation efforts, the CEO should act as the change champion. Examples of such champions have been incarnated by Lars Kolind at Oticon, Peter Lewis at Progressive Insurance, and the Fung brothers at Li and Fung (Rivard et al. 2004). A champion in this context usually creates the strategy for change and articulates the context and rationale for the new corporate direction.

During the change process, the transition team must create a detailed road map of all the activities that must be accomplished during the transition state in order to achieve the desired future state. The team will be required to undertake several different types of analysis, such as a stakeholder analysis which allow learning of who will be affected by a particular change (McKeen and Smith 2003), a risk assessment analysis (Aubert et al. 1998), and a root cause analysis which involves looking for and addressing the underlying causes of problems (Goldratt and Cox 1992). Furthermore, throughout the transition, change leaders should watch for and address inconsistencies in such practices as management policies, success measures and rewards that undermine the credibility of the change effort. They must ensure that messages, measures, management behaviour, and rewards all match the overall thrust of the change initiative (Duck 1993).

In short, for successful change to occur it is critical for the transition team to manage the “dynamic” aspects of change, not just the individual pieces of it. The cornerstone of this process is effectively communicating, throughout the whole organization, the new work processes that will define the changed organization (Duck 1993). In addition, the transition team must be responsible for managing the emotional connections that are vital for the successful completion of any business transformation (Kanter 1983).

(3) Impacts on individuals

The third key aspect of change in organizations concerns the experiences of individuals in the change process. Researchers and practitioners in our field have acknowledged user resistance as a
major obstacle to IT implementation success (Schultz and Slevin 1975; Davis et al. 1989; Marakas and Hornik 1996). Managing user resistance can be highly challenging. A recent study conducted by Lapointe and Rivard (2002) demonstrates that within the implementation of a given system, resistance can have a wide variety of antecedents and manifestations that can evolve and change in nature over time. Their recommendation is clear: “By treating resistance as a black box, researchers and managers limit their ability to adequately deal with it” (p.29). Rather, an in-depth examination of the relation between objects of resistance (e.g., new system), antecedent conditions (e.g., work habits), perceived threats (e.g., economic well-being) and manifestations of resistance (e.g., voicing) appears essential to understanding the complex dynamics of resistance.

From a slightly different angle, Bridges (1986) focuses on the psychological adjustment that individual members of an organization must make during change. He presents a three-part individual transition process that accompanies Lewin’s three-stage model of change. The first stage involves letting go one’s old situation and identity. The second stage is described as the “neutral zone,” where change targets move through a period of ambiguity and contradiction as they search for a new framework and identity that they can use to establish themselves in the changing organization. Bridges (1986) asserts that the third and final stage of transition cannot occur until the various losses experienced in the first two stages are recognized, accepted, and resolved.

Employees’ perceptions of the organization’s readiness for change have been identified as another important factor in understanding sources of resistance to large-scale change. Defined as “the cognitive precursor to the behaviors of either resistance to, or support for, a change effort” (Armenakis et al. 1993: 681-2), these perceptions can facilitate or undermine the effectiveness of a change intervention. In fact, most models of organizational change suggest that building momentum, excitement and buy-in to the change effort are critical components of any change suggested that employee attitudes toward a pending change can impact morale, productivity and turnover intentions.

An integrated change process framework

Each of the theoretical frameworks briefly described above focus our thinking about organizational change from the broader, general patterns of change that affect the organization as a whole, down to the difficult psychological adjustment individual members of the organization must make during the actual implementation process. Taken alone, however, these three perspectives do not provide a comprehensive or integrated understanding of the organizational change process that is useful for managers who find themselves in the position of planning and/or implementing change (Siegal et al. 1996). The Change Management framework (Burke and Spencer 1990; Burke et al. 1991) offers just such a perspective. This framework integrates the strengths of the theoretical perspectives presented above and incorporates important issues involved in evaluating overall effectiveness of the change process. As shown in Figure 1, the framework consists of the following six dimensions:

1) **Individual response to change.** This dimension concerns the nature, prevalence, and utility of resistance to change. Examples of related issues include: change is not always resisted; apathy can be more difficult to work with than resistance; involvement in the direction of change can reduce resistance.

2) **General nature of change.** This dimension is concerned with whether effective large system change is evolutionary or revolutionary in nature and the characteristic patterns that typify change efforts in organizations. Examples of related issues include: certain patterns
typify change efforts; effective change requires certain elements or transformation or dramatic steps.

(3) **Planning change.** This dimension deals with the causes of change in organizations, articulation of the vision, how to get from the present to the future, and barriers to effective transitions. Examples of related issues include: the importance of surfaced dissatisfaction with the present state and articulating a desired future; the power of “turf issues” among and between different groups and subcultures; involving people from all areas of the organization in the planning process rather than relying on a single entity or group.

(4) **Managing the people side of change.** This dimension is concerned with how, when and how much to communicate about change within the organization, and psychological issues related to transition. Examples of related issues include: the need to communicate what will and will not change; allowing people to disengage from and grieve the loss of the present state; utilizing the power inherent in groups as a positive force.

(5) **Managing the organizational side of change.** This dimension concerns the design and structural issues of systemic and long-term change efforts. Example of related issues include: the contribution of slogans and symbols to establishing credibility and importance; the need to reduce barriers and restraints to achieving goals rather than applying more pressure.

(6) **Evaluating change.** This dimension deals with the indicators of a change effort’s effectiveness. Examples of related issues include: recognizing that complaints can often be a sign of progress and positive energy; the need to modify reward systems to support changes in other areas; the importance of providing feedback to people regarding progress made.

The Managing Change Questionnaire (MCQ) (Burke 1988, 1990) has been extensively used to assess executives’, managers’ and OD practitioners’ different perspectives regarding the fundamental propositions in each of the above six sub-dimensions. The measurement instrument is grounded in principles and concepts derived from social psychology, organizational theory and organizational behavior as well as from consulting experience (e.g., Beckhard and Harris 1987; Duval and Wicklaund 1972; Kanter 1983; Lewin 1958; Lippitt et al. 1958; Schein 1985; Tichy 1983).

**Methodology**

The methodology adopted in this research was a survey. A questionnaire was developed and sent to the 2,211 Quebec members of the Canadian Information Processing Society (CIPS). This sample was chosen because CIPS members represent a wide variety of IT jobs and organizational settings. A total of 381 questionnaires were returned to the researchers within an eight-week period; 94 questionnaires were returned unanswered because of incomplete addresses (net response rate of 18%). One questionnaire was removed from the database due to missing data leaving us with a final sample of 380 respondents.

In view of the somewhat low response rate, it was necessary to determine how representative the sample was of the population of CIPS members in Quebec. It was reported (FIQ 2002) that 78.8% of their Quebec members were men, whereas 84.1% of respondents in our sample were men. With regard to education, 74.2% of CIPS members in Quebec were reported to have a university diploma, compared with 76.8% in our sample. Furthermore, about one third of CIPS
members in Quebec hold management positions in their respective IT function compared with 32.6% in our sample.

The MCQ questionnaire consists of 25 true/false items that measure agreement with fundamental propositions in each of the six dimensions of the Managing Change framework (Burke and Spencer 1990). The questionnaire was originally designed with the assumption that “correct” answers – i.e. those consistent with the theoretical and applied approached cited above – indicate respondents’ familiarity with, or knowledge about, important aspects of change management in organizations. However, it is also possible to interpret responses as indicative of various perspectives on the change process. Indeed, such an approach seems especially appropriate since many of the items have been delicately worded to stimulate thought and controversy in group discussions (Siegal et al. 1996).

A total score for the MCQ, as well as six unique scores (corresponding to the six dimensions outlined above) for a subscale associated with each dimension in the model, is obtained by simply summing the number of answers in agreement with the normative propositions, and converting them to a percentage format. In order to investigate group differences and similarities in responses to the model’s subscales, analysis of variance and t-test were used.

In 1991 results were reported based on responses obtained from over 700 managers (Burke et al. 1991). Since then, the instrument has been administered to an additional 1,840 managers (Siegal et al. 1996) and to a sample of 357 OD specialists (Church et al. 1996). The degree of knowledge and understanding that IT specialists have regarding key issues in the management of change will then be compared to that of those surveyed in previous studies.

The content validity of the instrument as a measure of knowledge and understanding of certain key principles and issues in the management of change in organizations is reasonably defensible (Siegal et al. 1996). Although the instrument is not intended to cover all aspects of change management, those issues it does cover are based on sound principles and findings from several fields of study. Importantly, the MCQ yields an adequate level of reliability. For dichotomously scored items, the Kuder-Richardson 20 (KR20) coefficient is recommended for estimating reliability (Carmines and Zeller 1979). Dichotomous items are scored one or zero depending on whether the respondent does or does not possess the particular characteristic under investigation. Thus, for the 25 items making up the MCQ test, a score of 1 was given when the respondent answered a particular item correctly but zero if the answer was incorrect. The KR20 coefficient obtained for the present sample of IT specialists is .74. Since KR20 is simply a special case of Cronbach’s alpha, the reliability of the MCQ test is satisfactory (Nunally 1978). Church et al. (1996) also reported an adequate level of reliability ($\alpha = .72$) for the MCQ instrument.

Finally, t-tests were conducted to determine whether differences in response time, early (n=335) versus late (n=45), were associated with subscale and total scores of the MCQ instrument (Linsky 1975). Results clearly revealed no significant differences in any of the variables of interest; hence, no significant non-response bias was detected.

**Findings**

Of 25 questions the average number of correct responses was 16.9, with a standard deviation of 2.5. Using simple arithmetic, this translates to 67.5% correct (based on a total of 100) or a grade of “C.” Thus, taking this score at faced value, our sample of practitioners does not seem to have a solid understanding of change management concepts and principles. On average, IT specialists of all job categories have seemingly not developed an in-depth understanding of the conceptualization, planning, management and evaluation of change in organizations. However, if
we were to examine the individual total scores on the questionnaire across the entire respondent sample and assign grades, these would have ranged from an “E” (at 44% correct) to an “A” (at 92% correct). Table 1 presents the complete breakdown of response patterns on the MCQ.

Insert Table 1 about here

Further analyses of IT professionals’ scores on the MCQ instrument confirmed an obvious lack of knowledge of several change management issues. For instance, only 8 of the 25 items received a better than 80% selection rate of the correct response. Bear in mind that “correct answers” in the present context means agreement with Burke’s answers for the 25 true-false items. As another example, 9 of the 25 items did not reach more than 60% agreement with Burke’s answers.

Interestingly, IT specialists in our sample did not perform better than managers, who provided correct answers 71% of the time (Burke et al. 1991), and OD practitioners, who got an average score of 80% (Siegal et al. 1996). The latter result, in and of itself, is not really surprising. Indeed, contrary to OD specialists, IT professionals are not in “the business of change” per se. As stressed by Markus and Benjamin (1996), change agentry should not be conceived as something IT specialists might do instead of doing traditional IT work. Rather, managing change must be considered as a part of IT work. Considering the rising impact technologies such as ERPs, CRMs and the Internet are having on today’s organizations as well as the paradigm shift experienced in the IT profession these days, we assert that change management must represent an essential part of IT work. Hence, it is suggested that having a strong, theory-driven framework regarding managing change and the skills to support that theory must represent critical areas of focus for both actual and future IT specialists.

Additional analyses indicated significant differences in overall agreement with the MCQ scores by job type. All respondents who indicated their job function were divided in three groups. The first group (n=124) included senior IT managers (e.g., VPs and IT directors) while the second group (n=96) was exclusively composed of systems/business/BPR analysts and the third group (n=42) was formed of technical personnel (e.g., programmers and network technicians). Perhaps not surprisingly, it appeared that senior IT managers tended to agree more often with Burke’s answers than did technical staff (F=3,646, p<.05). Figure 2 provides the mean scores for each of these groups.

Insert Figure 2 about here

Because the MCQ instrument is based on a theoretical framework, with discrete conceptual components, subscale scores can be generated for different aspects of the model. This allowed us to refine our analyses by identifying the strengths and weaknesses for IT specialists on specific areas regarding change. As shown in Figure 1, the Managing Change framework is depicted as a triangle in order to convey two main ideas. First, each of the six dimensions is an integral part of one’s overall knowledge regarding change. Second, each dimension builds on those below it. Therefore, knowledge of the fundamental aspects of change (individual response to change & general nature of change) is critical to the process of planning, managing, and evaluating change. In order for a change effort to be successful, actions and events need to be based on a sound understanding of how people respond to change, as well as how transitions affect and are affected by organizational processes. According to Burke and his colleagues (1991), those who have this
understanding are better prepared for managing the process of change than are those who don’t understand the underlying dynamics of change.

Oddly enough, our analysis of the MCQ scores reveals that IT specialists are more knowledgeable about the process of change than about its underlying dynamics (t=62.349, p<.001). On one hand, this finding makes sense when one considers that IT specialists in general are “doers” who are comfortable with designing and implementing information systems, processes, and methods. Few of them spend much time contemplating why change occurs or why it affects people the way it does. On the other hand, this result can also be worrisome since it suggests that IT specialists might be following a set of heuristics for how to manage change without really understanding why. Hence, we firmly believe that a critical factor in helping organizations to chart and manage a course for change is an understanding of fundamental aspects of change. The individual response to change dimension addresses the distinction between change that is embraced and change that is resisted. The items in this sub-dimension deal with resistance that stems from two conditions, namely, loss of the known and tried and loss of personal choice. This dimension also addresses the difference between managing resistance and managing apathy. As shown in Figures 3 and 4, IT specialists scored quite low on this sub-scale (second lowest score). As for the general nature of change, which covers broad, universal topics such as whether certain clear patterns typify all change efforts and whether change requires certain significant and dramatic “leaps” rather than moderate, incremental steps, results are quite consistent among job types (average of 69% correct). Surprisingly, technical personnel have scored higher than the other two groups on this particular sub-dimension (see Figure 4).

In terms of demonstrating an understanding of the process of change, our respondents performed well on two of the four sub-scales, namely, managing the organizational and people sides of change (see Figure 3). In fact, overall, these two dimensions yielded the best scores. It was interesting to note that the highest number of correct answers obtained was for managing the organizational side of change subscale. This sub-dimension centers on managing organizational aspects of change – the reward system, the organizational structure, barriers to reaching the end state, and the use of institutional symbols to facilitate the transition process. As expected, Figure 4 reveals that senior IT managers, and to a lesser extent, systems analysts demonstrated the most agreement in the area of managing the organizational side of change (F=5.556, p<.005). This is good news since senior IT managers are increasingly involved in and responsible for spearheading change efforts and guiding organizations through transitions (e.g., Smith 1999).

In terms of managing people issues, one would expect senior IT managers and systems analysts to be more familiar with these elements of change management than are technical personnel in general. Although results associated with this sub-dimension are not as high as managing the organizational side of change, they confirm the above contention (see Figure 4). It seems reasonable to suggest that this outcome is based, at least in part, on technical personnel’s fewer interactions with the targets of change (i.e. systems’ users) in organizations.

The final two sub-dimensions, namely, planning change and evaluating change, received average responses of 66% and 51% correct, respectively. These results clearly indicate that our respondents are not well versed with the planning of change, a component which emphasizes the planning and articulation of the future state, surfacing dissatisfaction and using these data for energy, and overcoming the mire of organizational politics. These findings also reveal that IT specialists are even less familiar with the importance of keeping momentum and positive energy
directed toward the change goals, monitoring progress, and providing feedback to members about any change milestone that is reached, no matter how small. Overall, we expected better of IT managers who presumably deal with planning and evaluation issues in their own functional area.

**Conclusion**

IT specialists from all industries realize the fact that in today’s world to maintain the status quo is to face organizational demise. They are also increasingly aware that they can be effective change agents (Markus and Benjamin 1996; Smith 1999). In this regard, what we have reported here are the results of a study of 380 IT specialists and their knowledge concerning fundamental concepts of managing change in organizations. While this group may not be representative of the field as a whole, and whether the data yielded by the survey can be generalized to others, remains to be seen.

Perhaps the most obvious finding and somewhat disappointing one is that the average score on the MCQ instrument is a 67.5%. One could say, then, that today’s IT professionals receive a “C” in managing change. An average score of 67.5% is passing, but it indicates insufficient knowledge of some very important issues. IT specialists know the importance of, for example, involving people (98% correct), but they are not as knowledgeable about many of the subtleties of organizational change. One example is the need for organizations to change rewards systems to successfully support most business transformations. This particular item was correctly answered by less than 40% of our respondents. Another widely missed item refers to the idea that a reduction in the organization’s problems does not necessarily represent clear-cut evidence of progress in the change effort (21% correct).

In general, our analyses reveal that IT specialists are more knowledgeable about the process of change, more particularly managing the organizational and human sides of change, than about its underlying dynamics. We firmly believe IT specialists should be knowledgeable in both areas if they are to help organizations manage change effectively.

As anticipated, senior IT managers and systems analysts have a significantly better grasp of many of the issues inherent in organizational change efforts than do technical personnel such as programmers and technicians. In particular, senior managers and systems analysts received higher scores than technical staff in five of the six content areas of the Managing Change framework.

As more IT specialists struggle with change on a day-to-day basis, perhaps they will better grasp the dynamics of change. Through trial and error, perhaps they will get it right. But this analysis would argue that managers need greater awareness of the fundamentals of change and more skill development in leading people through change efforts. General implications for educational programs in IT are also obvious. There is still a debate about the place of “soft” skills training in IT curricula. Based on the findings presented in this study, we concur with Markus and Benjamin (1996) that the IT community should engage the “soft” skills education issue proactively. We firmly believe that both undergraduate and graduate IT students must be exposed to various theories of change management. Although a comprehensive discussion is outside the scope of this paper, these theories must focus on a sound understanding of how people respond to change as well as on how transitions affect and are affected by organizational processes. The IT student who has this understanding will be better prepared for acting as an effective change agent than is the student who doesn’t understand the dynamics of change.

This research is part of a larger research program on IT change agentry. Our understanding of the relationship between IT specialists and change management is still at a very early stage and
we feel this is an important area for future research. For the time being, if the findings of this research have stimulated more questions than answers, then we believe we have done our job as researchers.

References


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Table 1. Response Distribution for MCQ Score

![Figure 1. The Managing Change Framework (adopted from Siegal et al. 1996)](image-url)
Figure 2. Total Scores by Job Category

Figure 3. Scores on Managing Change by Subscale
Figure 4. Subscale and Total Scores by Job Category