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Resistance to Technological Change in Academia

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Initiating changes in technology, promoting utilization, and managing resistance by faculty may be among the most pressing challenges for academic leadership. Change that involves new technology is an ideal example of the systemic nature of organizational change because it includes infrastructure, expert knowledge, training, long-term vision, cost-benefit equations, and sufficient utilization to sustain the change. The literature on organizational change supports this premise that is exemplified in this article by anecdotal evidence from two universities. The first example describes the challenges in promoting utilization of Internet2 technology and the second describes the introduction of a project involving Voice-over Internet Protocol.

For change agents, managing change and working through resistance may be their biggest challenge with regard to implementation and utilization of new technologies. Change that involves technology implementation is an ideal example of the systemic nature of organizational change. It requires not only infrastructure, but expert knowledge, training, a long-term vision, and sufficient utilization by followers to sustain the change. The training and utilization aspect of technological change may be the most significant candidate in managing change resistance. The complexities of organizational change are viewed here through the framework of technology implementation.

The following essay will discuss two separate examples in two affiliated universities, illustrating the problems of rolling out synchronous technologies with the goal of enhancing teaching opportunities. Each example is about a new and complex technology introduced on campus and the chain of events that followed. The examples are based on retrospective accounts of the author having been associated with each project: one as change agent and the other as an observer. A literature review of change resistance theories that target the uniqueness of technology implementation and utilization in academia connects these examples together.

The first example will describe the ongoing efforts of a small team of people at Northern New York University Two (NNYU2)[1] to increase the utilization of a relatively new Internet2™ (I2) technology. This example is shared because it may benefit other universities that are attempting to acclimate their faculty to synchronous technologies. The technology will be briefly described, student research on I2 utilization will be shared, and current initiatives will be documented. Recommendations for overcoming change resistance will be presented.

The second example is a completed project of Voice-over Internet Protocol (VoIP) implementation at Northern New York University Three (NNYU3) in which I was the principle investigator and lead change agent. The process of funding, implementation, program growth, and eventual collapse, will be described. The example illustrated how one individual with vision and energy can drive, but not sustain, change. An analysis of

how resistance overcame the potential benefits of the technology will be analyzed in light of contemporary change theories.

The Perplexities of Resisting Change in Academia

Resistance behaviors in academia have a deeply rooted history. According to Rodriguez (2005), there were over 2,574 documents in the ERIC database when he searched teacher education *and* resistance (Kitchen & Rodriguez). The search results resistance in terms of diversity, discourse, curriculum changes, and of course, technology. Technological advancements represent one of the most visible areas for educational change and reform (Horn, 2002). But when it comes down to faculty members changing their old ways of teaching and adapting their courses to include technologies, reform is slow. Delay tactics are commonly employed from "the old timers who like things as they were" (Cohen, Fetters, & Fleishmann, 2005). The expectation and enthusiasm of administrators in higher education that invest in and pour over new technologies may not match the enthusiasm of teaching staff. While administration and information technology (IT) departments roll out technological products, the slow rate of adoption by professors is frustrating to administration. Some experts feel that the introduction of technologies triggers behavior changes and attitudes in organizations (Cameron & Green, 2004). A consistent theme in the technology resistance research is that "pushing hard would create even more resistance" (Cohen, et al. 2005, p. 326).

Internet 2™ (I2) is a separate Internet system reserved for research and education applications. It is a member-driven cyber community that promotes partnership, opportunity, and exchange among many disciplines (Building Tomorrow's Internet, 2007). Using a combination of Internet based technologies including video voice-over Internet protocols, I2 provides "unique partnership opportunities that together facilitate the development, deployment, and use of revolutionary internet technologies" (Building Tomorrow's Internet, 2007). I2 offers opportunities for collaboration, partnerships with other teaching venues, and a way to attract students to learning through the thing students know best – interactive communication technology.

The Introduction of Internet *2*™

To acclimate the faculty and staff to I2 NNYU2 held a faculty seminar in May of 2003, to introduce and demonstrate the benefits of I2 technology. The enhanced learning experience for students was attractive to university administration and not long after the demonstration, the campus administration rolled out Internet 2™ capability. This signaled a committed to the technology but the costs to implement the technology were very high, in excess of $80,000 per year (Technician, personal communication, April 2007). In spite of the availability of economic development grants to support the implementation of the project, the cost to sustain the technology after implementation would be exceedingly high, therefore, acceptance to change and technology utilization was critical.

Four problems can be identified as barriers to successful I2 technology change at NNYU2. First, the awareness of and interest in any type of teaching technology is minimal. Second, there is a lack of motivation to learn and change teaching patterns to include technology. Third, and something familiar to all organizations, implementing change is a common psychoanalytic conundrum, which represents a mix of personalities and quirky behaviors. Finally, recognizing the existence of a condition that is far from equilibrium, which state is inherent in a dynamic environment like academia.

A Lack of Internet

A pervasive lack of awareness and interest in I2 technology was quantified by a group of my graduate students at NNYU2 in their needs assessment/data analysis class project in the spring of 2007. The student group was assigned a needs assessment project focusing on Internet 2™ utilization by faculty. Their task was to collect data, substantiate the suspected gap, and make recommendations to close that gap. Their first step was to become familiar with the technology and then engage in qualitative data collection methods that included interviews, surveys, and a focus group. What they found surprised them. Seventeen out of 37 faculty interviewed were not aware of the I2 technology on campus. In another survey, six out of 35 faculty members had no interest at all in the technology while the other 29 had some interest in learning more (needs assessment students, personal communication, April, 2007). Comments reflected a range of dispositions from a total lack of awareness to an inability to visualize how the technology would benefit them.

Although this survey conducted by the students was informal rather than comprehensive, it provided some sense of faculty's level of awareness and interest in the technology. Lack of awareness and interest is a form of resistance behaviors. Negative effects may arise due to a lack of knowledge concerning change. According to Horn (2002), the teachers who have been in the system for a while know that change is cyclical and that if they ignore it, it will eventually go away.

Lack of Motivation to Learn

The second barrier was the lack of motivation to learn and/or change teaching patterns utilizing technology. The inability to learn has been

identified as a resistance factor that is common in many organizations which, often involves leader and follower dynamic. With regard to technology, fostering a learning environment is a critical leadership competency. According to Bergmann and Brough (2007), motivation to change is regarded as one of the practical strategies to be implemented in group settings. I2 technology utilization is far more than a bullet item on a professor's to-do list; it requires a commitment to learn that surpasses attending a one-time demonstration. This may be the point at which time commitments, motivation to learn and adapt, and prioritizing academic duties, collide. Often the motivation to learn about new technologies gets a low priority because of competing demands of the teacher's time (Horn, 2002).

The motivation to learn new technology is a barrier that was substantiated by the students in the needs assessment class referred to earlier. They discovered that faculty who were motivated, identified a difficult learning curve ahead of them. Further, the students deduced that even if faculty members learned about the technology, they had a difficult time understanding how to connect the technology to their course content (needs assessment students, personal communication, April, 2007). Learning and adapting has a social nature to it and poses a challenge for faculty members set in their ways (Bergmann & Brough, 2007). It is easy to get comfortable with mediocrity. Changing teaching patterns takes motivation and energy with or without technology.

Motivating reluctant followers means that leadership has to break through the stubbornness and lack of enthusiasm by shaking up deep-seated beliefs, attitudes, and behaviors that have been in place over a long period of time (Bergmann & Brough, 2007). They cite "ten reasons why school personnel don't follow the leader" (p. 17). Five out of the ten have relevance in this case. The implication that a faculty member is not motivated or does not want to change their own habits is substantiated here as they pertain to implementing I2 technology. They are; a) a limited vision of the future, b) a comfort with the way things are, c) deficits in information and communication, d) the individual's nature to be uncooperative, and e) that they do not have the skills to do what the leader is proposing (Bergmann & Brough, 2007).

As a faculty member I have observed examples of technological skill deficiencies of other faculty at NNYU2 in past semesters which are cited as reasons to resist technology. One simple example is the opportunity to use the two new digital video cameras that were purchased for colleagues in a specific department. After having the motivation and initiative to learn about the new cameras I offered to train a few others on the equipment. Some grimacing at the thought of technology, they were not interested in learning and were content using the old, if not outdated, equipment. It is also a striking example of how quickly technology evolves. Students who are handed a VHS tape to review their speech assignments seldom have VHS players available to them because they are almost obsolete. Resistance to any type of change is predominant in some departments (needs assessment students, personal communication, April, 2007). This balkanization that is referred to by Horn (2002) creates isolation and alienation among and within departments. It can become a culture that breeds resentment toward change (Horn, 2002).

A Common Psychoanalytical Conundrum

Collective and individual personalities have a tremendous impact in the success of organizational change. Fear and anxiety are strong forces behind resistance, and in this case, resistance to technology (Jarrett, 2004). The starting point for skill assessment required to utilize technologies varies greatly among teaching faculty. The motivation to overcome that fear and learn is linked to the personality type. Individuals in non- technology oriented departments could find technical knowledge intimidating, if not completely useless. In these cases, interventions are necessary to help individuals overcome their fear and sense of personal inadequacies (Jarrett, 2004).

The common psychoanalytic conundrum, or puzzle of personalities, can contribute to the barriers that are built with regards to rolling out new technologies. Some approach technological change by ignoring it. Yet, this cynicism by teachers seems counterintuitive to the mission of higher education. They represent a group of followers that are "capable but cynical" (Bergmann & Brough, 2007, citing Kelley, 1988, p. 5).

The proposed change may not be exciting or inspiring enough – and faculty may be asking *what is in it for them*? The degree of reluctance to adopt change may be nothing more than a product of an individual's personality quirks. If that same person were isolated from other individuals it might not be a problem, however, resistance behaviors can become contagious. This resistance, or reluctance to change, is displayed at every opportunity. According to Bergmann and Brough (2007), academics display resistance behaviors in private conversations, during large group decision making gatherings, in small group sessions, in casual conversation, chance meetings in the hall, the parking lot, grocery store, or game. Rumors, especially those out of control rumors that grow from fear, can sabotage change efforts before they have a chance to take hold (Cohen, et al. 2005).

Finally, faculty may resist I2 because it presents a challenge, or compromise, to the integrity of their scholarship. There was not a lot of data to support this perception, but it makes sense that faculty fear that they will risk the loss of their unique personality and expertise in the classroom. They might perceive their roles as changing from professor to facilitator through access to other classrooms in real time collaborations. Whether consciously or not the loss of identity and self worth are valid reasons for resistance. Oreg's (2003; 2004) research on personality, context, and resistance to change, particularly the resistance to change scale (RTC), comes closest to qualifying this perception. Horn (2002) points out that teachers may resist reform because it does not agree with their expectations. Attempts to acclimate with the new technology may do nothing more than raise levels of anxiety and fear. According to Cameron and Green (2004), "human nature can throw a wrench into the best-laid IT plans" (p. 262). This compounds the perplexities of change resistance to technology in academia.

The Far from Equilibrium State

The far from equilibrium state is inherent in academia. According to Hargrave and Van de Ven (2004) "there is a systemic nature to technological advances" (p. 282). It could be argued that academics do not understand the systemic picture of change (Horn, 2002). Complexity theorists offer a perspective that serves the greater picture that is well suited for the dynamic environment of academia. Organizational change, in terms of technology implementation and utilization, is never a perfect fit. But as described in a change/stability paradox from complexity science, there are many changes of equal significance happening at the same time. To understand the change process, leadership has to manage stability while at the same time, cultivate chaos. Although the path of change that I2 as a single technology is part of other dynamic forces, its implementation is threaded throughout the structure of the organization. This systemic nature of change was conveyed in the Babson College case in which one change in curriculum triggered at least 250 other changes (Cohen, et al. 2005).

This state of disequilibrium lies at the heart of all change but is exemplified in systemic technological change and innovation. Hargrave and Van De Ven (2005) referring to work of various systems theorists, write that there is "the tension and interplay between the utility-maximizing behavior of individuals and the deterministic effects of institutions i.e., between action and structure" (p. 259). This state may present the greatest barrier to utilization of I2 technology because in this paradigm it is natural for the organization to exist in a permanent equilibrium seeking state. In other words, it is a condition that defines academia. Measuring the progress of change is defined by Hargrave and Van de Ven (2005) "as the difference in form, quality, or state over time in an intuition. Change in an institutional arrangement can be determined by observing the arrangement at two or more points in time on a set of dimensions" (p. 261).

Systems thinking models of change and resistance explain how the entities or actors change deep structures. In this case, the actors are faculty and administration, and the deep structure is the university as a whole entity. According to Drazin, Glynn, and Kazanjian (2005) most improvements in process involve choices in deep structure. The choices assume an organization of units and that basic activity patterns maintain its existence. Choices are the fundamental elements that make a system operate (2005). In the case of implementing I2 at NNYU2 the choice of each individual moves the system farther from equilibrium unless they are making the same choice at the same time. According to Drazin, et al. (2005), technology scholars look at the actors that construct change and the process by which change is constructed.

It is the convergence of numerous actors, numerous events, that is needed to transcend boundaries (Drazin, et al. 2005). For some, this may seem a bizarre way to view technology implementation in academia, for others this process of interaction gravitates toward or away from entrepreneur and resister. This equilibrium seeking motion may characterize the process in academia. Hargrave and Van de Ven (2005) include a focus on a process model that examines the science of events that studies the co-evolution of technical and institution change. Resistance to change is embedded in the culture of academia and resisting the utilization of technology epitomizes this behavior (Bergmann & Brough, 2007; Horn, 2002; Kitchen & Rodriguez, 2005). A culture change is often a necessary systemic component of implementing technological change (Cameron & Green, 2004).

The Ticking Clock

The adoption time for this technology, rather than the reluctance to use it, started the change clock ticking. According to an information technology technician working on this project, the cost of not using this technology was higher than the cost of using it (technician 1, personal communication, April 2007). The equilibrium between organizational benefit and financial risk was upset with the introduction of the technology. Who would mobilize change and bring back organizational equilibrium after punctuated equilibrium (Emery, Lewin & Weigelt, 2004) was not exactly clear. Limited

utilization from one department on campus was not enough to balance the equation.

Internet 2™ was not the first and probably will not be the last innovative technology to reach campus. Since a significant portion of NNYU2's academic interest is to train new teaching professionals, teaching technologies are an imperative. The decision to bring I2 to campus was not haphazard and the support for change was well thought out. Demonstration events were organized for faculty, support systems and personnel were made available, and most importantly, governance and infrastructure were solidly organized behind this change initiative. To close the gap between the fear of new technology and the adoption of it, resources were created and those in place were mobilized. In spite of all of these pieces in place, change resistance remained a powerful force and there did not appear to be broad based faculty driven interest (faculty member, personal communication, December, 2007). In fact, enthusiasm seemed to radiate from only one academic department that felt that I2 would be an asset in developing international linkages to programs. This begged the question: with all of this support in place why was there a significant deficit in interest, adoption, and utilization of technology? As if this writing, there are few active collaborations and projects utilizing I2 at NNYU2.

Implementing and encouraging utilization of new technologies is a unique type of change process as this example has shown. The cost of failure is higher than utilization costs for most change initiatives. Like any type of high-risk investment, a long-term cost benefit analysis is a prudent measure to engage in, particularly before implementation of technology. Without baseline criteria for utilization, or utilization study benchmarks; and without a rigorous change plan, this university like many others in similar situations would be ill-advised to proceed with any new technological initiatives.

Many organizations, and maybe some of the leadership at NNYU2, are guilty of being overly enthusiastic about the potential of a new technology without fully realizing a complete vision. The assumption could be that if it works great in one place it will naturally catch on in other areas. This reasoning is faulty because it does not address the differing goals and opportunities that each actor brings to the change problem. It is unreasonable to assume that the vision of leadership is a shared vision. As Bergmann and Brough (2007) suggest, all stakeholders should be a part of developing that vision and recommend a "vision task force" (p. 25). In a conversation with the technology coordinator for NNYU2, I discovered that the majority of faculty lack vision or ideas as to how they can use this technology in a pedagogical sense (personal communication, December, 2007). Hence, a recommendation for NNYU2 is to emphasize long-term vision and create a better plan for the next systemic communication technology opportunity. Although awareness-building efforts are ongoing it is only a gesture that affects just a few variables and keeps the organization in a state of disequilibrium.

Innovation and vision does not always flow from the top leadership down to faculty and staff as shown in this next example of technological change in academia. Innovation and entrepreneurship are terms often linked to organizational change. The following example provides anecdotal evidence of the systemic nature of change and how resistance behaviors may exist on many levels within the organization.

Example 2: A Systemic Change Problem

From 1997 until late in 2003, I served as director of a continuing professional education project located within the continuing education department at NNYU3. The mission of this grant-funded project was to provide health care workers; which included all allied health professionals, physicians, dentists, behavioral health workers, and first responders, with accredited continuing professional education. The list of professionals who needed continuing education to retain their licenses was significant and access to education was sparse in the rural and isolated region in northern New York. The gap between training opportunities and those that needed training certifications in their field was wide and complicated by health care worker shortages. Time constraints and travel distances to professional education conferences deterred allied health care workers from receiving the continuing education and certifications they needed to stay current in their fields.

The leadership at NNYU3 was optimistic that the stagnant and revenue draining health care education project could turn into a viable and healthy enterprise for the university and the community. Perceptive marketing and hard work got the project off the ground but efforts to connect with educational opportunities that could overcome limitations of access and travel continued to curtail the mission of the project. The solution was to be found in communication technology. Communication technology grants were flowing during this period from the federal government to close gaps between lack of access to education and healthcare in rural areas, and the opportunities and resources that were available elsewhere.

The fact-finding research phase prior to writing a grant revealed that Voice-over Internet Protocol (VoIP) and the new networks that supported

the technology was the most viable way to accomplish the professional educational goals. VoIP is a communication technology that converges network technologies to produce a synchronous video and voice capability (Miller, 2000). Simply put, a group of people in a conference room at a hospital on the eastern border of New York State could participate in a live conference at NNYU3 through equipment and connectivity provided by this grant. In real time, the audience in eastern New York could see and hear the presenter, ask questions, and at the same time, the speaker and audience at NNYU3 could see them. The network provider served as the hub of connectivity between all of the entities involved. That meant that the VoIP relay was made possible by the provider's wide area network (WAN) and that could link every member on the network who chose to participate in the conference.

With the fact-finding research completed, the grant writing began in partnership with a small rural hospital. The isolation and small size of his hospital nestled in a small New York town was a boost to the potential outcomes for the grant reward. The partnership and hard work paid off and the continuing professional education project became the award recipient of a federal grant, which supplied hardware for video conferencing and connectivity to NNYU3 and a telemedicine unit to the small hospital.

Once the grant award was announced the administration at NNYU3, not fully expecting the grant award, seemed thrown into a frenzy. The telecommunications award coincided with a capital construction project. As a result, the new buildings had to be wired to accommodate T-3 broadband lines and room designs had to create storage for the equipment and to accommodate conferencing venues. During these first months there was much campaigning, politicking, and compromising with faculty and administration around campus to promote the new program. The new technology coordinator had difficulty connecting the mission of undergraduate education together with professional continuing education and community service. There was the problem of a conflicting change vision and a second, bigger problem that had to be addressed.

Technology Intervention

Through the membership structure of a wide area network provider, the continuing professional education project acquired access to 45 other members that had live video conferencing technology. Most of those members were hospitals, allied health facilities, and universities. Although the technology and membership were in place the problem was *what* exactly, could run through these communication technology channels. The questions of what to provide as an educational product, how it would be financed, and how it could be accredited, marketed, and packaged was yet to be solved. A model had to be developed to facilitate, and make accountable, the continuing education's strict guidelines for awarding credits.

Inspired by the needs and working relationships of area dentists a model, or prototype, for professional education that utilized VoIP technology was developed. Working in collaboration with a dental school, the continuing professional education project had made continuing dental education available live to dentists in northern New York at the same time it was being seen at the dental school in western New York. This continuing professional education project using synchronous technology grew to become the conduit of educational opportunities, relationship building, and marketing strength for a variety of continuing education programs utilizing VoIP.

Using this as a model, an additional federal grant application was submitted and a grant was awarded that supported a variety of expenses including programming fees for trainers, marketing materials, line charges, and fees. Between 2000 and 2003, the continuing professional education project provided continuing professional education through VoIP technology to hundreds of pharmacists, physicians, dentists, nurses, behavioral health workers, and first responders. The program was successful but to remain active it required expert knowledge, human energy, daily maintenance, marketing, and money to keep the change wheels turning.

Good Ideas Can Fail

Change initiatives can fail in an organization because the organization does not prepare for change. Organizational readiness has proven to be a significant factor in the success of change and the lessening of resistance. Organizational readiness was addressed in several of the change models as a prerequisite to change including Cameron & Green (2004), Sevcik (2004), and Palmer (2004). Palmer described an assessment process that determined whether change would overwhelm an organization. He compared an organization's capacity to a soaked sponge unable to absorb more change. The academic environment, as far as readying the infrastructure, graciously accommodated many of the details that the new VoIP project needed, but it was most likely overwhelmed. Although the university leadership was enthused and supportive of many technology initiatives on campus, NNYU3 as a systemic and human environment was not.

According to Palmer (2004), "changes that fail usually do so because of human, not technical, reasons (p. 35). The information technology (IT)

department was evolving from a maintenance role on campus into a decision-making entity that had been given a higher level of authority at about the same time the installation of the VoIP technology was commencing. Looking back, this may have been the point that, to borrow a popular phrase, *all hell broke loose*. The chain of command shifted and individuals who were being cultivated to support the new VoIP technology were being redirected. Additionally, communication channels between the forces that would be most likely to make change succeed were not open. Without the informative and collaborative function of communication, change was doomed (Elving, 2005). The fragmented communication opportunities among departments and personnel to keep necessary information flowing was a clear indicator that the organization was not ready to sustain a rapid rate of change.

A successful technology roll out process requires adaptiveness (Cameron & Green, 2004). It is a competency that requires the organizational members to learn about and become familiar with the capacity of the technology to "transform the business processes" (Cameron & Green, 2004, p. 249). This characterizes the third reason cited for failure; innovation was not adapted or diffused through the university. In systems thinking, adaptability and the organization's learning capacity are the most fundamental elements in supporting change. Adaptability requires an organizational membership that is willing to learn and grow. I agree with Cohen, et al. (2005) that academia may not be the best setting for technological innovations to thrive because of its culture and comfort in doing things the old-fashioned way.

Lepsinger and Yukl (2006) observed "uncertainty is greater in times of rapid technological change" (p. 3). Technology often poses new threats that further the organization's inability to adapt. The rapidly changing infrastructure at NNYU3 needed expert knowledge and collaboration of an expert team to support this stream of change. Sevcik (2004) wrote that "diffusion is a social phenomenon" (p. 1). Uncertainty and doubt fostered cynicism, a social manifestation of resistance, which made adaptation and diffusion throughout the university impossible. Further, opportunities of subsystem innovations were stopped as soon as they were started because without collaboration of an expert team, there was no way to connect the ideas with the technology. Although this solution to problems surrounding access to professional education seemed like a good idea, it was destined for failure because of the gaps that open in a rapid systemic change process.

The Collapse of the Project

The leadership at NNYU3 never seemed comfortable with the rapid changes brought about by the VoIP project and camps of resentment began to form. Some parts of the administrative staff were distracted by cheaper technologies to expand non-health care professional education and undergraduates markets internationally. The college leadership believed strongly in the growth of technology in education and the enthusiasm enabled the professional continuing education project with latitude to grow; however, the original vision was shifting as international education opportunities grew. The original vision of the continuing professional education project as the hub of regional health care education was being subverted by a new vision of the university as an international provider of undergraduate training courses. The support needed to sustain the infrastructure and funding was being threatened by conflicting goals and gaps.

The maintenance and growth of professional education programs for health care providers was dependent on two components, expert knowledge and willingness to pay. A huge change in operation, infrastructure, and programming, which was supported by only a few people, could not be sustained. Resources were sparse and even with supplemental grants it was difficult to cover costs associated with access to expert knowledge and the complex system of management that had to be built around VoIP utilization. The continuing professional education project could not sustain against the forces of internal resistance, the changing marketing needs, and the persistent unwillingness to pay for the programs. Hence, the project was shut down and the equipment was stored. The hospital, the other beneficiary of the grant, continued to utilize their telemedicine unit and eventually their community acquired the equipment that was once used at NNYU3. Persistence and continual campaign for change had been the glue that held all the pieces together in the first years of the project. Today, there is little or no utilization of video conferencing technology for continuing professional education in the region. This example may offer lessons for other institutions that are attempting to roll out technology initiatives to support education projects.

The Lessons Learned

The continuing professional education project and NNYU3 was not the only technological and entrepreneurial fatality of its kind. At a 2003 technology conference hosted by Senator Hillary Clinton and a chamber of commerce in central New York, attendees struggled with the exact issue that NNYU3 had – how to implement, utilize, and sustain technological advances to support educational and health care opportunities. One could argue that the

state as a whole recognized the rapid rate of change in technology itself exacerbates the difficulties in implementing technological change. The conference organizers tried to cultivate collaboration and entrepreneurship within the educational and healthcare markets with the belief that "change is mobilized by politically savvy entrepreneurs" (Hargrave & Van de Ven, 2006, p. 296). There were several take away lessons from Senator Clinton's conference. Although not stated in the program's agenda, I realized that the discussion was about a variety of differing goals among organizations using technologies, funding streams were frequently diverted, and that key change agents changed positions frequently. Entrepreneurs were building technology projects on a moving floor and the collaboration that was dependent on expert knowledge was being played like a shell game.

There were probably many reasons for the failure of the long-term utilization of VoIP educational technology that came to NNYU3 while I was serving as director of the continuing professional education project. In fact, a case analysis might be applied to each subsystem of the organization that led to uneven and failed development (Hargrave & Van de Ven, 2006). This particular change initiative was trying to jump into a fast moving current of bigger change initiatives and was washed up on the shore. Hargrave and Van de Ven stated that "few if any institutional changes begin with a clean slate; instead…[they] inherit actors and infrastructure that require …crossing, grafting, or recombining existing institutional arrangements in novel ways" (p. 296). In summary, conflicting long-term goals, lack of organizational readiness, and the inability of the organization to adapt and learn were the most likely causes for the collapse of the VoIP project at NNYU3.

The grant award was somewhat unexpected and a conflict in long-term technology goals may have thwarted growth and change. Resistance to change can often be attributed to conflicting goals. In this particular example, several technological innovations rolled out at the same time to satisfy different goals on campus. The administration was balancing politics, innovation, entrepreneurship, and service to learners with too few resources including human capital and funding. One competing technological goal involved a distance learning project with an affiliated educational institution that had long standing political and economic ties into the university. Another was the student Internet infrastructure on campus that was craving updates, which would have siphoned off one-third of the technology capacity from the T-3 lines running the VoIP system. Finally, there was a less sophisticated VoIP being tested at the university to teach language, culture, and technical courses to students overseas. There was no doubt that conflicting goals meant conflicting technological products and opportunities, which, layered over the politics, context, and individual personalities, created one fine mess (Oreg, 2006).

Many lessons were learned as a result of the project at NNYU3, and the most important was that "not all good ideas get adopted" (Sevcik, 2007, p. 1). Technological change within an organization is less of a paradox and more of a risk-benefit equation. Leadership, when rolling out new technologies, are engaged in a type of risk taking that is dependent on the acceptance of the technology to catch up to, or neutralize, the risk. The organization does indeed try to get back to a place of financial equilibrium through the utilization, or acceptance of, the technology. Beckhard's formula of $C = (ABD) > X$ has relevance in analyzing technological change. The cost of the change, X, had to be less than dissatisfaction with the status quo, times the desirability of the end state, times the practicality of the change (Cameron & Green, 2004). It is of some consolation that the president of the college said, in a recent conversation with me about the project, that the technological innovation coming out of the continuing professional education project was "way ahead of the curve" (December, 2007). Today, ongoing efforts, vision, sophisticated planning, and innovative management have increased the success rate at this university for implementation, utilization, and mitigation of change resistance.

Conclusion

Information technology initiatives account for 30% of an organization's expenditures as cited by Cameron and Green (2004). The resistance phenomenon exacerbates this burden and may mask the actual costs associated with change. Leadership may not easily identify a direct causal link between the employees' negative or difficult behavior and the change initiative. It is likely that any manager as change agent would have been perplexed by the range and pace of transformations in employee moods and attitudes. Employees may not articulate their concerns unless the change agent opens up communication opportunities. Because successful change is systemic, a leader's complex skill set should extend beyond managing the leader-follower relationship during change and into the leader-organization, board of directors, and stakeholder relationship. Inefficient and poorly managed organizational change can be costly, particularly technological change (Cross, Johnson-Cramer, & Praise, 2007).

The intent of this essay was to support change resistance literature with examples from academia in which I was a stakeholder and observer. The two examples of technology innovation and implementation supported the literature in describing the phenomenon of change resistance, particularly in academia. They are two illustrations of the systemic nature of change, the complex nature of change resistance behaviors, and the peculiarities of the implementation of new technologies in an academic setting.

Footnotes

[1]The names of the universities, organizations, individuals, and program titles were substituted with fictional names to protect the confidentiality of the individuals and organizations.

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