"A CASE OF TELECOMMUNICATIONS (MIS)MANAGEMENT" CASE ANALYSES

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RELINQUISHING EXPERTISE TO BECOME A MANAGER

ROGERS'S ANALYSIS

In implementing the new phone system at InstruMedia Corporation, Fred Davis thought he had done everything right. But obviously, his best laid plans did not work out as expected. Only 40% of InstruMedia's employees had gone to any of the training sessions, hundreds of complaints flooded his office the week after the installation, employees had all kinds of difficulties using the system, and 11 internal units made the mutinous decision to buy themselves answering machines instead of using the new equipment. Adding to Fred's headaches, InstruMedia's new chief information officer, Pat Dittmer, seemed to be siding with the strongest dissenters, and Dittmer had asked one of his own people, Bob Brunson, to help Fred's telecommunications group weather the storm. In fact, it was beginning to look as if Fred could be in jeopardy of losing his job. So what now? How should Fred deal with the flurry of problems resulting from the less-than-perfect implementation? And, if he does survive the current crisis, how can he more successfully manage future initiatives?

No doubt, Fred Davis was appointed recently as InstruMedia's telecommunications manager because of his proven expertise. Yet, Fred's words and actions suggest that he does not fully understand the nature and obligations of his new managerial role. Moreover, he does not seem to be aware that the current crisis may stem, to a very large degree, from his failure to manage. In fact, he has distanced himself from the crisis by hiring a consultant, setting up a hotline, getting his staff to log employee complaints, and sitting in his office revising the end-user training schedule. Indeed, Fred's focus on task-related rather than people-related issues suggests that he has a great deal to learn about his new job.

RELINQUISHING EXPERTISE TO BECOME AN ENABLER

Like the newly appointed managers Hill (1992) studied, Fred seems to regard managing as doing more of what he had been doing all along—namely, being an expert—only with more responsibility, more accountability, more power, and more control. Since becoming telecommunications manager, Fred has functioned primarily as a *doer* whose decisions have been driven almost entirely by his expert knowledge. Indeed, to implement the phone system he did a great deal: He "explained," "pointed out," made his case, and with the assistance of his telecommunications staff, he "arranged everything from the hardware deliveries to the setup of the training rooms." This focus on doing betrays Fred's deeply held attitude about his new job: "I'm the expert here, and I'm responsible to see that changes get implemented properly." In Fred's mind, the cut-over to the new phone system went as smoothly as could be expected. "When we installed the new system," he might say, "it operated exactly as we planned it to. It's just too bad our employees failed to take the training we provided for them." Indeed, from a technical point of view, the new phone system may have been an excellent solution to InstruMedia's long-term operational needs, and yet employees at all levels regarded it as a big mistake.

How could this be? It is pretty clear that Fred can mount arguments for change; it is not at all clear whether he knows how to convince those most affected by it or, heaven forbid, to enlist their feedback as part of his decision-making process. Responding to InstruMedia's influential vice president, Paul Bucter, Fred offered a personalized training session. There is no evidence that Fred inquired about the particulars of Bucter's difficulties or tried to help him right then and there (e.g., "So, is it the playback function that doesn't seem to be working? Why don't we try this function right now? Maybe with a few calls back-and-forth between you and me we can figure out the problem."). Neither did Fred ask this influential vice president for his functional and political insights on the matter.

A manager must relinquish the security of being the chief expert and assume the far less predictable role of asking for others answers. In fact, more often than not, a manager may feel helpless to do anything but listen, a state of being from which Fred has been quick to insulate himself. He seems blind to the multiple organizational issues inexplicably involved in managing change. He continues to regard his "daunting task" as devising and implementing proper solutions; he seems unaware that his expertise alone does not equip him to fulfill his managerial responsibilities. He has not yet begun to shed his *doer* role to become an *enabler*.

CREATING CONDITIONS FOR OTHERS' SUCCESS

In the planning stages, Fred's supervisor, Megan Varnesh, cautioned him that the proposed changes would "require everyone to learn a whole new user interface." But Fred neither heard Megan nor considered the implications of her concern; namely, that the proposed changes could have a dramatic impact on users and that impact could be costly, particularly if user needs went unaddressed. What did Fred do? He compared vendors, he discovered that Lucid Systems alone could offer a networking architecture capable of handling a large-scale customer like InstruMedia, and he negotiated a great price for Lucid's services. In sum, he determined what

should be done based on the optimal technical and financial concerns, he enlisted the support of his colleagues in telecommunications, he announced the change company wide, he directed users to take the training, and he got the new system installed—all in a period of just 12 weeks.

By contrast, Fred's efforts to determine user needs appear to have been minimal. He did not conduct interviews, focus groups, or town meetings with the employees who would be using the system. He did not run pilots to check the compatibility of the system with user needs. He did not administer dry runs to test the impact of the installation. (One wonders how he expected to train employees without exploring what they needed to know.) Now, more than 700 complaints later, Fred has been forced to consider user needs and to change the system he so carefully planned. Lucid, for instance, has been asked to make six to eight modifications so that the system operates more "like the easy-to-use VoiceMax interface" to which many employees are accustomed. If such users' needs had been identified during the planning process, maybe the current mess could have been avoided.

Unfortunately, Fred does not appear to be learning that his managerial obligation involves creating conditions to ensure the success of others. In fact, Fred and his staff regard Bob Brunson's comments about "customer satisfaction and providing world-class service" as an attempt to fault their vendor selection. Instead, Bob could be trying to get them all to think about the internal customers they serve.

GETTING THINGS DONE THROUGH OTHERS

Fred thought he had done a good job implementing the new phone system because he got "buy-in on all the major decisions." But who did he ask to buy in? He asked his own telecommunications staff, and they, by all appearances, seem to have readily endorsed his plans—recall how Susan Ring rose to his defense when Megan Varnesh posed an objection? Users, on the other hand, were not approached. Instead, Fred and his staff hammered out the de-

tails and arranged everything from the hardware deliveries to the setup, so when InstruMedia employees showed up for work one Monday morning, 17,000 of them had new telephones on their desks, and 39,000 had new voice mail boxes. Throughout the entire process, all Fred expected of InstruMedia employees was that they take the training. What could be easier? Why were they complaining rather than thanking him? Actually, InstruMedia employees had good reason to complain because Fred asked too little of them; he did not get their endorsement or their insights. To Fred's credit, he did expect a great deal from his telecommunications staff who rallied to help him implement the new system in no time at all. But Fred did not expect the employees most affected by the change to contribute to the decision-making process; rather, he made the decisions for them. He did not activate these employees, but rather, he and his staff acted on their behalf.

Of course, limiting the sphere of expectations to the telecommunications staff—experts of the same kind—was probably an efficient approach in the short term. Getting "outsiders" involved would have undoubtedly complicated matters and slowed the implementation process significantly. But it has been observed that getting buy-in requires exposure to the dynamic, competing forces at hand and that it involves managing conflicts and making trade-offs (Hill, 1992; Quinn, 1988). Clearly, Fred does not understand this, and unfortunately, no one seems to be teaching him either, not even his supervisor, Megan Varnesh. She did not question his misguided answer to her inquiry regarding user needs. Did she really think he would decode the implications of her ambiguous question, or did she simply not care enough to challenge him?

The situation at InstruMedia is a reminder that the obligations of managing are multiple and paradoxical: One must analyze and inquire, direct and enable, and network with insiders and outsiders alike to ensure that all significant sides are heard, to balance competing views, to facilitate consensus, and to get buy-in. It has been argued that becoming a manager "constitutes a profound transformation" involving thinking, feeling, and valuing in new and unfamiliar ways (Hill, 1992, p. 5). There is little to suggest that Fred

Davis has begun this transition. In the midst of the crisis, Fred seems oblivious to the fact that his management, or the lack thereof, may be the real source of the current problems. If he does not recognize this soon, Bob Brunson may be asked to replace him in the near future.

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IN PRAISE OF MINIMALISM

TAYLOR'S ANALYSIS

According to Star and Ruhleder (1996), we ask the wrong question when it comes to discussing infrastructure. Rather than "What is infrastructure?" we should be framing the issue differently; we should be asking, "When is infrastructure?" What they mean by this question can be stated as follows: Although we tend to think of infrastructure as an objectively definable and backgrounded nexus of networks and facilities, this is overly simplistic. We should be thinking relationally. One person's backgrounded, out-of-sight/out-of-mind infrastructure may well be a foregrounded, very salient, to-be-dealt-with puzzle for someone else. Infrastructure becomes infrastructure at the moment it is treated as infrastructure, not before. And different people will make that transferral at different times. There is no single objective definition of infrastructure. That is why the key question is one of "when"—not "what." You should never take somebody else's infrastructure for granted. It

could very well not be the same as yours. The case study before us is a telling instance of what can happen if you do. It illustrates a problem that frequently bedevils the implementation of new technologies, which have not yet become so much a part of the normal context of work that they can be treated as "mere" infrastructure.

PROBLEM ANALYSIS

There are a number of similarities between the case we are now considering, namely, Fred Davis with his voice/e-mail system, and the one described by Star and Ruhleder (1996). Although they investigated a rather small and specialized community of geographically scattered biological scientists, in other respects the issue was the same: how to furnish a centralized state-of-the-art technology intended to serve all employees and allowing for easy intercommunication. The result was the same in both cases: great system but nobody using it much (or when they did, they were not happy with it). In Star and Ruhleder's example, even the people who claimed to like their new system turned out, on closer inspection, not to be using it. When this fact was pointed out to them, these biologists responded that they had been "just going to boot up." Well, at least they did not complain, and unlike unhappy Fred at InstruMedia, there was no threatening figure of a Pat Dittmer looming in the background.

There are some general principles involved here. One is that what is easy for someone who is used to working with a system is hard for someone else who is not. This difference becomes particularly worrisome when one of those involved is the designer or a techie, for whom all the jargon is transparent, and the other is a naive user for whom it *is* jargon. Telecommunications managers should be particularly wary of this factor because they usually are persuaded that a system is easy to use, as Fred was, by someone for whom it actually is—namely, the vendor, Lucid Systems.

A second principle is that learning to use a new system almost always takes more time than the vendors allow for, and the learning comes at a cost: It is time not spent doing your main job and, for

busy people, this can be a serious inconvenience. The usefulness of "training sessions" is greatly overestimated because almost no one learns that way. Effective learning occurs through trial and error, frequent use, and getting helpful advice when you need it—not according to some trainer's schedule. So people, being sensible, avoid training sessions, as Fred found out.

Both these problems are exacerbated when it is somebody else who is deciding on the choice of system for you—imposing it on you, from your point of view. Every large organization, at least in Weick's (1985) opinion, is a mixture of tight (at the local level) and loose (at the global level) coupling. Because of the loose coupling side of organizational communication, there is a good deal of de facto local autonomy and of development of group cultures around different activities. This local autonomy and activity-based group culture is a plus—not a minus—for an organization because it makes the organization more adaptive to its environment. But it also creates a certain "touchiness" when it comes to centralized planning—especially in the wake of a merger, which is universally recognized to be an extremely tense experience!

Finally, there seems to be a growing phenomenon of *technology battle fatigue*. Hype ends up breeding skepticism. We have had a succession of "miracle" technologies over the past generation, but somehow, the miracle remains just around the next corner. This problem has been attracting growing attention in the sociological literature that addresses new technology implementation. The gap between expectation and actual performance is ascribed by Sachs (1995), for example, to the conceptual gulf between "organizational, explicit" views of work and those that are more "activity-oriented, tacit." Systems designers and managerial planners, such as Fred, tend to think organizational, explicit. What Sachs and others in the same research tradition are highlighting is the extent to which work depends on accumulated routine and on informal cultural practices that become encrusted on the work situation. Whenever technology interferes with this largely invisible (because tacit) aggregation of tiny adaptations to circumstance, it becomes no longer a help but a hindrance. It is this that I would understand as

the motivation for the 700 complaints with which Fred had to cope in the first week after the new system was installed (and in the midst of the holiday season, at that!).

RECOMMENDATIONS AND MUSINGS

So what is a good strategy in technology choice and implementation? What I would suggest is to take a leaf out of the system designer's workbook. In the earlier days of system design, the construction of a computer program of the kind used to model and control organizational process followed a principle of block design. Block design was a top-down logic that meant taking a comprehensive view of the system and building an analog of it constructed out of formal computer code to represent organizational activities. This kind of thinking—treating the organization as if it were a logically structured and fully coordinated embedding of routines and subroutines, although it began as an exigency imposed by computer logic—began to migrate over into the literature on management. The classic reference is March and Simon's (1958) *Organizations*, which, for the first time, laid out a fully elaborated blueprint of the organization as an information-processing system, on the model of the computer. The influence of this pioneering book (and it has been very influential) was hardly accidental: One of the authors, Simon, already a recognized authority on administration and organizational economics (for which he won a Nobel prize) was also a star of the new field of artificial intelligence. It was March and Simon's book that legitimated the kind of top-down rationalizing approach to management that we have seen illustrated in the present case.

But current system analytic practices in computer design have moved away from these earlier monolithic symbolic representations to a reliance on much more flexible methodologies such as object-oriented programming and hypermedia.[1] The advantage of these newer approaches is in the economies they open up. If you can treat the objects in your program as encapsulated routines, then you can ignore their internal complexities. You can, instead, concen-

trate on designing better ways to link them up. Let us call this the *minimalist* approach to design whether we are discussing design in software or administration. A minimalist approach assumes that, instead of standardizing across the board, good telecommunications planning aims to disturb as little as possible the islands of local adaptation. Good telecommunications planning concentrates on transparency and flexibility at the interstices.

It is true that standardization has been the rallying cry of the telecommunications industry for many decades (with permanent international committees for whom it is their principal concern). But the idea of a common standard for all, independent of local reality, is, in fact, a concept with much deeper roots that go back to the very idea of modernity (Bowker & Star, in press).[2] A degree of standardization is obviously necessary for there to be a system at all, but the relationship between standardization and productivity is curvilinear. Performance is initially enhanced by standardization, but beyond a certain point, the relationship turns negative: Too great standardization depresses performance whenever it inhibits local adaptation. The postmodern challenge is to admit the continued existence of local variety by limiting standardization to that which is minimally necessary.

This challenge even makes good organizational sense. One of the great classics of the artificial intelligence literature is Ross Ashby's (1960) *Design for a Brain*. It is a book that could as easily have had the title "Design for an Organization" because the principles he outlines are equally valid for social, as well as for cognitive, organization. His main point is that any system capable of adapting successfully to an even minimally complex environment cannot be one with complete communication between every element in it. There has to be a degree of local autonomy for the indispensable accumulation of adaptations that makes an organization responsive to its environment. Ashby's other point is that levels of communication must be able to vary over time; the thresholds of communication must be variable, depending on circumstance.[3]

So now let us consider the questions we have been asked. I will take the second one first: How can Fred convince his organization

to stay with voice mail and e-mail, for the good of the company? My answer would be that he should not even try, if what is meant by "staying with" is the centralized system Fred initially had in mind. When a battle is lost, it is lost.

Instead, to answer the question of how to proceed in implementing the new e-mail system, he should concentrate on developing the best system he can and making it available for cross-group and intraorganizational communication. There is no danger of the company abandoning voice mail and e-mail in today's world; these are rapidly becoming universal facilities. All he has to do is to ride the wave.

This raises a supplementary consideration. One of the things that got Fred into trouble was that abrupt August 1 switchover. Such all-at-once strategies are tempting for managers because they connote decisiveness and, in the words of reengineering, a "revolution" in management. But they are an invitation to the kind of disaster with which Fred found himself confronted. A better, if less spectacular, strategy is incrementalism: Start modestly and take the time to make sure that at least some people are comfortable with the new system.

One dangerous illusion that surrounds the technology wave is that technology design ends at the door of the developer. In fact, technology design is a continuous phenomenon; technology design continues after the machinery has been installed in the user community location (Barley, 1986; Heaton, 1997; Orlikowsky, 1991; Orr, 1996; Suchman, 1987; Taylor, Groleau, Heaton, & Van Every, in press). By proceeding incrementally, the telecommunications manager gets the benefit of learning about the design process that is going on in his or her own firm. Do not just consult "a handful of well-placed executives" in developing policy—go talk to actual users.

And this brings us to the first question: how to stem the flow of complaints about the new phone and voice mail system. The answer is: wait, do not panic, keep working with people. The root of the problem is trying to accomplish too much too fast—however tempting it is to do so in an era of what Cushman and King (1997) call "high-speed management."

I would like to make a couple of final remarks. I am not sure Fred's neck is safe; that big, bad chief information officer, Mr. Dittmer, looks like he could be a real meanie. But, hopefully, Fred will survive to take up a position of responsibility somewhere. After all, he sounds like a good guy. If he does take another position, he might want to bear in mind one or two precepts. The first is that we always take the vendor's assurance that the system is up to every challenge with a grain of salt. We need not attribute anything but the most honorable of motives to the developer to nevertheless suspect that there are going to be problems in implementation. In my experience, there are always problems. It is not necessarily a fault of the system (although sometimes it is); the issue is much more fundamental (and this is the issue I raised at the beginning of my case analysis). Any large organization is a congeries of quite diverse cultures—each of these diverse cultures is at a different level of "infrastructurization" (to coin a term) of its technological mix. So the successful implementation of any new technology is going to be variable across the spectrum, and intelligent planning needs to take account of this variability.

My second point is that the design-of-technology process does not stop when the product is advertised as a "new technology" and sold. Technology remains a surface of emergence (Heaton, 1997; Orlikowsky, 1991; Taylor et al., in press) for the display of human intentionality, even after it has been implemented. It is for this reason that a degree of incrementalism is indispensable in the introduction of new systems.

And, finally, I would recommend that Fred (and the rest of us) be careful about raising the expectations of superiors too high. If they are disappointed, they will not see the contingencies with which you, as a manager, had to cope, but just the result. You get to carry the can. Your headaches will be invisible to them, but theirs won't!

NOTES

1. Object-oriented programming has as its objective to encapsulate frequently performed functions, in much the way we have become accustomed to do on our computer screens

where, by simply activating an icon on the screen, we obtain a desired response ("Print," for example). Once designed and encapsulated, such functions can be used in constructing other programs, with a resulting economy of time and effort. Hypermedia allow for associational, or horizontal, links between terms and concepts and thus provide great flexibility, compared to the earlier tree structures with their rigid hierarchical search procedures. The Internet employs hypermedia extensively, and in many respects, this feature explains its popularity.

2. If there is any meaning to the term *postmodern*, it seems to me that it is this: If, beyond a certain point, standardization has negative payoffs, then the postmodern challenge is to balance the need for local variety with systemic requirements of standardization. Such a balancing act is a direct consequence of globalization and is, thus, an unforeseen consequence, or "perverse effect," of modernity.

3. Interestingly enough, the field of artificial intelligence is now coming back to Ashby's (1960) way of thinking. For a discussion of current thinking about Ashby's work, see Taylor & Van Every (in press).

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COMMUNICATION IS THE KEY
TO RECOVERING USER TRUST

FINN'S RESPONSE

The telecommunications team at InstruMedia Corporation faces a number of thorny problems. Many of these are of their own making, and those that are not are traceable to the InstruMedia executive team, which missed an opportunity to work together to manage a common problem. This analysis is organized around major issues in technology implementation. In addition, it presents a chronological treatment of the problems, and so we start with the charge-back system.

CENTRALIZATION/DECENTRALIZATION DECISIONS

The degree of centralization is sometimes presented as a technological decision and sometimes as a management decision. Almost without exception, however, a decision in one arena affects the other. Typically, a charge-back system is designed to ensure that every unit within an organization pays for the resources it actually uses. The cost-control principle behind charge-back is decentralization of decision making. But charge-back systems work only if the units incurring the charges have a choice. For example, a company can reduce the overall cost of centralized computing resources by distributing control for those costs across units. This is because some units will avoid paying those costs by reducing

use or by finding other ways to get the work done (e.g., desktop computing).

Consequently, management cannot simply decentralize costs without decentralizing the decision to incur those costs. Imagine a charge-back system for e-mail expenses. If the e-mail system is integral to the work of every unit, every unit will pay the charges because unit members decide that the cost of not paying them is too high. In a company without a history of e-mail use, however, a charge-back system runs the risk of having some units opting out of e-mail because they do not see the benefits.

Yet e-mail, voice mail, and virtually all communication systems are critical mass technologies. Among other things, this means that the greater the number of people using the system, the more useful the system is to everyone. Voice mail presents a peculiar problem as a charge-back technology because the two primary applications for voice mail technology are very different. The first is call answering, which is analogous to using the system as an answering machine.

Call answering is primarily an individual application, although forwarding call answering messages to others is a major advantage that voice mail has over answering machines. The second application for voice mail is internal messaging, which is analogous to using the system like a voice version of e-mail. While call answering can provide hard-dollar savings, internal messaging can provide large soft-dollar savings through increased productivity. With the proper training, short voice mail messages can replace longer and hard-to-complete telephone calls for a variety of tasks.

Unfortunately, a surprisingly small number of organizations have implemented voice mail in such a way that the users understand the value of internal messaging. InstruMedia has clearly worked toward having a large community of users for internal voice mail, but it is not surprising that a number of units would see answering machines as a cost-effective choice when the decision making is decentralized. However, such a decision works against the organizational goal of using voice mail as a company-wide communication system. Because InstruMedia saw voice mail as a company-wide communication resource, decisions about voice mail should have been kept centralized.

The silver lining in the InstruMedia charge-back problems is the useful information that it brings to the telecommunications management team. Currently, many units do not see voice mail as better than answering machines. Users who have not experienced the "telephone time management" and improved productivity value of using voice mail for internal messaging are frequently unpersuaded by statistics and charts. The telecommunications management team could arrange conversations with respected managers who are experiencing benefits to which the mavericks can relate. If the team treats this situation as an opportunity for educating users, then they may yet return these users to the voice mail fold. Interestingly, centralized decision making was also partly to blame for the problems with the implementation of the new telephone switches and voice mail systems. Although the decision to implement was the responsibility of the telecommunications management team, they would have benefited greatly from increased communication with the population of users in the company.

USER INVOLVEMENT AND COMMUNICATION

One of the cardinal rules of technology implementation is to involve users in the process. This is particularly important for the former Imminence employees who probably experience more uncertainty about the recent merger than other employees. By communicating with the user population early in the cycle, system designers can incorporate options that suit the intended audience.

In the case of standard, off-the-shelf systems such as voice mail, user input plays a slightly different role. Users can still be polled about a variety of available features and system options. I suspect the InstruMedia and Lucid Systems staffs conducted standard station reviews used to specify individual telephone and voice mail requirements. But the simple task of communicating with the user population about any upcoming changes should not be underestimated.

Yet, there is no sign that the telecommunications management team ever presented their fellow InstruMedia employees with (a) an explanation of the problems the company faced, (b) a request for their support during the transition, or (c) a warning about the learning curve they would need to endure to enjoy the benefits of the new Lucidity system. The switch made obvious sense to the telecommunications management team, but they needed to educate their user base.

Even if users are not involved in the design of the system, they *must* be allies in any successful system implementation. Presented with a problem, most people choose to be good corporate citizens. Shown a solution, most will do their part to help the organization succeed. I return to specific recommendations for communication with the users after presenting a (faulty) problem analysis.

(FAULTY) PROBLEM ANALYSIS

The 700 complaints received after the cutover needed to be taken seriously but also should be kept in perspective. They represent fewer than 2% of the 39,000 employees with new voice mail boxes. With such a disruptive change in the daily routine of the user population, the telecommunications management team should have anticipated some level of complaints. If they had, their analysis would have been based on whether the complaints exceeded expectations and why. The actual volume of complaints appears to be normal for this type of implementation and, therefore, should have been anticipated.

When a crisis is looming, any organization looks to its senior management team to provide stability. Pat Dittmer, the new InstruMedia chief information officer (CIO), failed his staff and the organization by not standing behind the decision made by his people. First, he should have seen there was no reason to panic. Second, he missed an opportunity to establish a relationship based on trust and respect with the telecommunications management staff. Third, he could have personally handled the complaints from his executive peers. Fourth, he should have seen that this was a short-term prob-

lem, so the solution lay within the InstruMedia organization—not by having the vendor alter the product.

OPPORTUNITIES IN RESPONSE TO THE PROBLEM

If I was the consultant hired to recommend a solution to the current set of implementation problems, I would recommend the following actions:

Communicate with the users. The telecommunications team should immediately send a letter to all employees. This letter would be designed to accomplish several strategic goals. First, it would acknowledge the churn caused by the new systems and apologize for not communicating earlier with the employees. Second, it would explain the basic reasons why the change was necessary as well as the advantages to individual users and the organization as a whole. Third, it would request employees' support during this transition to the new systems. Fourth, it would attempt to (belatedly) set user expectations by estimating the amount of time required to become familiar with the new telephone and voice mail user interfaces (typically, 3 to 6 months).

Distribute new documentation. It is not clear what documentation was distributed to users at the time of the cutover. But it is important to realize that most users know what features they really need. What they need most is information about those features in the new system. A transition from one user interface to another is facilitated by providing a cross-reference chart that lists the feature name and compares the button presses used in the old system with those needed in the new system. This could answer many of the most pressing user questions about both the telephone and voice mail features.

Reimplement training. Hopefully, the telecommunications team used two types of voice mail training: one for new users and another for users switching from one voice mail system to another. Regard-

less, by the time any additional training could be implemented most users will have struggled through the basics, so another approach might be more successful at this point. In this new approach, I would recommend the continued use of a hotline—not so much to take complaints but to provide instruction about particular features. When people change user interfaces, they know what features they value. What they need to know is how to access those features on the new system. Hotline personnel can also let callers know where to look for new documentation in their mail.

Involve senior management. A classic principle of organizational change in general, and technology implementation in particular, is the need for senior management buy-in and involvement. Some executives apparently see themselves as victims of this implementation. This is an opportunity for the CIO to enlist their support in pulling the organization out of this problem.

The executives can support the decision to switch to the new systems, and they can communicate this support to their people. In addition, the CIO can salvage the charge-back system by preserving the critical mass of users needed to make a communication system successful. One approach would be to enlist the support of the CEO and all the executives in using the voice mail system for occasionally distributing messages to their staffs. Because those with answering machines cannot receive such information, the value of voice mail vis-à-vis answering machines now becomes obvious.

Implementing a new e-mail system. On the question of how to proceed in implementing a new e-mail system, I advise that the team proceed carefully. The lessons of this case point out the necessity of engaging the user population early in the process. The e-mail system being considered will change not only the user interface but also how and where messages are stored. As with user interface issues, the telecommunications management team must anticipate a learning curve and guide users through these changes. But if there are clear business reasons for changing systems, the failure to do it right once should not stop the team from attempting to do it right the next time!

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