

MIS and Telecommuting: Friends or Foes?

Let's say that you've just gotten all your company's PCs and workstations interconnected without glitches, including the ones that need to talk to the mainframe for mission-critical purposes. After all that work, now your boss wants you to set up connections to employees' homes. Does this situation sound familiar? MIS, meet teleworking and its right arm, telecommuting.

Teleworking is any form of substitution of information technology (IT, such as telecommunications and computers), for work-related travel. That includes computer, audio and video conferencing between work sites and such activities as telemarketing and call center operations. *Telecommuting*, a subset of teleworking, refers to periodic work outside of the central office, one or more days per week either at home or in a telework center. The primary object of substitution is the daily commute to a workplace, on either a part-time or full-time basis. Whatever you call it, these distributed work patterns are beginning to have a noticeable effect on MIS operations.

Telecommuting is not a fad that will go away. Rather, its growth has been proceeding according to our long-range forecasts for several years. A recent study for

By Jack M. Nilles

A noted analyst of and consultant for telecommuting strategy outlines the ways that it can pay off—if you avoid the lurking conflicts.

Telecommute America!, a nonprofit organization in Scottsdale, AZ, that promotes telecommuting, found that nearly two-thirds of *Fortune* 100 executives view telecommuting as not only good for employees but also advantageous to employers. And the word is getting around. There are more than 10 million

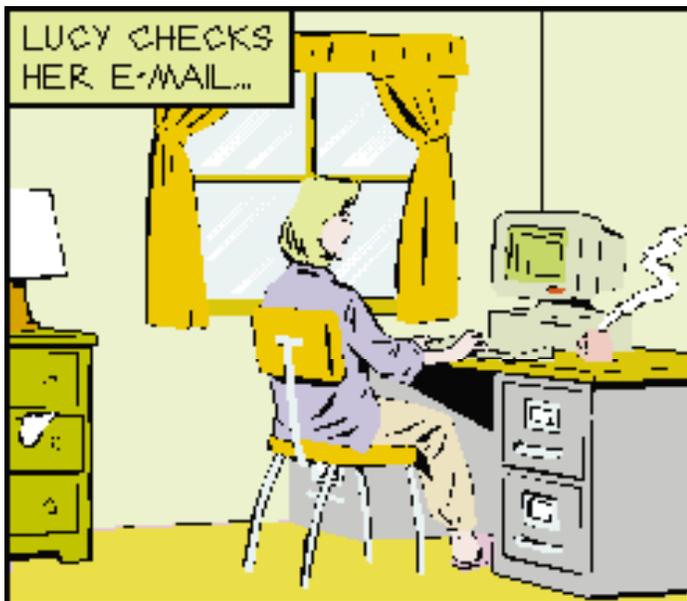
telecommuters in the United States today, and the number should double by the end of the decade—to more than one of every 10 workers in the country.

Properly designed and implemented (those magic words), telecommuting works for a great variety of employees. Essentially, a potential *telecommuter* is anyone whose job involves solo thinking or communicating that does not require face-to-face interaction. That amounts to about half the U.S. work force—and the fraction will increase as computers and telecommunications become even more sophisticated. The reason employers like it is that it produces net benefits to them, which is also why telecommuters and the communities they work in like it. Everybody seems to win, except possibly the downtown building owners and shopkeepers and the automobile industry.

The Impact on IT

If you're the one in your organization who saw this advantage and convinced the CEO to try it, you've probably worked out the IT implications. If not, there are important telecommuting issues to consider.

First, not all telecommuting is technology-intensive. Some telecommuters do nicely with just a phone line, paper and

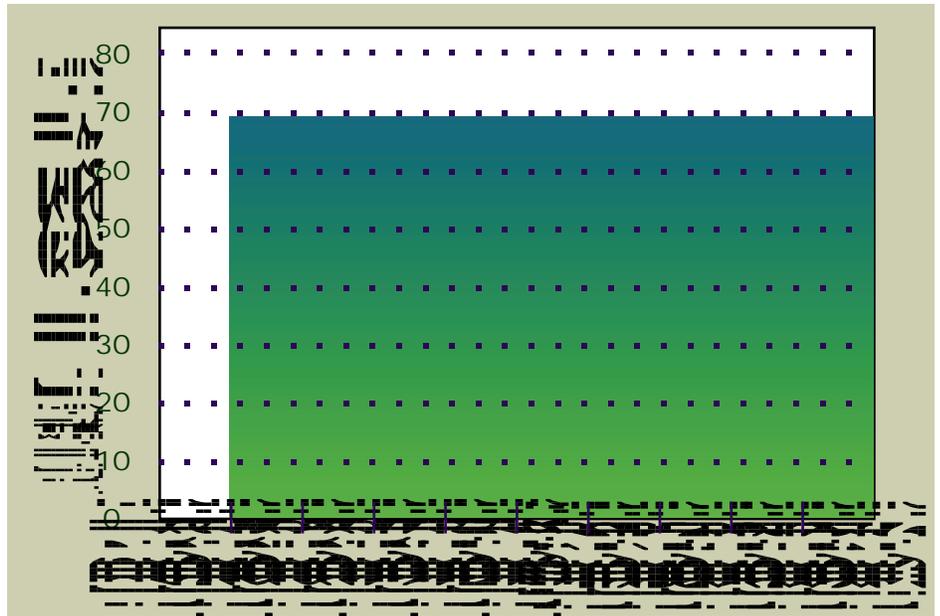


writing devices. In some organizations with which we have worked, these low-tech users constitute as much as 30 percent of the telecommuters. Thus, they are essentially not a problem to IS managers. At the other end of the spectrum are the full-time workstation users who need lots of access to CAD/CAM databases and/or full-motion video. For them, modem connections won't cut it and an integrated services digital network (ISDN) line may be marginally adequate; asynchronous transfer mode (ATM) may be the only acceptable solution. These cases require planning and expenditures.

Most telecommuters fit somewhere between the extremes. They use PCs but not all the time. They need access to their office PCs, but "sneakernet" may suffice for file transfer. If they do need LAN or server access, that's most likely to be bursty: short transmissions at irregular intervals. If you routinely monitor traffic on your system now, it's fairly simple to anticipate such usage patterns. In fact, telecommuting may smooth out the peak loads because, for example, the telecommuters may check on their e-mail earlier in the day than if they were to wait until they got to the office.

Whatever the needs of telecommuters are today, you can be sure that the technology demand—and network access needs—will increase in the future. But that's the news whether or not you have telecommuters. The primary difference between telecommuters and the stay-at-officers is the data-link location between their computers. All in all, the flip answer to what they *will* need is this: whatever they need now plus an added telecommunication connection.

There are other system issues, such as the central question of access to the company databases. Which telecommuters need absolutely current company data for all they do? How many can make do with slightly older data, perhaps on a CD-ROM? How many can wait until they are in the central office for that access?



Almost unknown 10 years ago, telecommuting is now practiced by 10 million U.S. workers, and that number is expected to double by 2000.

Source: JALA International

Remote Possibilities

Another key question is what sort of network is required to provide the interface to the telecommuters. There are two basic telecommuting options: work at home or at a telework center. For home-based telecommuting, IS should provide enough phone lines to satisfy reasonable peak demands and enough bandwidth per phone line to satisfy user needs. For most telecommuters, 28.8kbps modems will do this year. For those using imaging systems, requiring video conferencing or needing access to large graphics files, ISDN may be in order. Yet as equipment arrives that complies with the H.324 and H.263 video conferencing standards, conventional telephone service may still suffice for telecommuters who need almost face-to-face interaction.

As for computers for telecommuters, many organizations have adopted the strategy of providing laptops instead of desktop PCs, together with docking stations in the central office. This looks wiser as laptops gain in capability and drop in cost. One of our insurance industry clients provided its telecommuters with duplicates of their home office desktop equipment.

On the other hand, some organizations ask users to pay to telecommute. Because of budget constraints, few departments in the City of Los Angeles could afford computers for their telecommuters. Most required that prospective telecom-

muters provide their own PCs if they needed them, although the city has arrangements with local superstores to provide corporate discounts to city employees. Consequently, Bruce Roberts, the city's telecommuting coordinator, says that lack of city-provided equipment has not been a major deterrent to prospective telecommuters.

One way to reduce costs without eliminating the traditional office environment is a *telework center*, which can vary in size from a few to hundreds of workstations. If the center is wholly owned and operated by the company, it can be treated like a normal remote site with local networking, a wideband data link to the central facility and video conferencing. If it is a multiclient center, the center operator may or may not have a variety of suitable options. In any case, the key requirement for a telework center is that it be located close to the homes of the employees who work in it.

Security Satisfaction

Security has to be considered a basic element of the telecommuting network design. Security precautions start with restricting access to the company's data. A variety of technology solutions are available, ranging from a packet filtering router at the network interface to elaborate systems with token cards and multiple firewalls. As companies begin to use the

Internet for telecommuting support as well as advertising and customer support, security issues will grow. But most of these considerations will result from the more general Internet activities. Telecommuting will just be another component of the package of network services you need to provide. Some organizations with telecommuters, such as the California Franchise Tax Board (which collects state income taxes in California), will allow some telecommuters to work only from telework centers, where physical security can be maintained more readily than in employees' homes.

When the City of Los Angeles was developing its telecommuting program, one of the concerns was control of access to the mainframe that contained personnel, payroll and other sensitive data. According to Michael Galvin, the IS coordinator on the city's telecommuting task force, the issue was resolved by issuing smart cards to deserving telecommuters. Further, all the telecommunications connections went to a firewall server that used a call-back system to make the working connection. Yet, as many city departments have developed their own LANs and provided direct access to their telecommuters, the demand for mainframe access has not been as severe as was anticipated.

The most critical component of a good security system is not technological: the telecommuters themselves. The admonitions you give to in-office employees may need added emphasis here. Don't write passwords down where your teenage hacker can find them; change passwords regularly; use a password-keyed screen

saver; and so on. Yet, lest the fears of ram-paging telecommuters keep you up at night, remember that telecommuters tend to be more loyal to the company and less likely to give you trouble than some of the nontelecommuters.

Managing Management

By far the highest barrier to acceptance of telecommuting is between managers' ears. Effective telecommuting management requires that telemanagers focus first on clearly specifying the tasks to be performed, then concentrating on the results produced by their employees, rather than the work processes used to produce them. You can't manage by walking around if there's no one around to walk to. Yet many managers feel dependent on eyeball contact with their employees as a prerequisite for effective supervision. This attitude is based on the assumption that the workers won't work well if the boss isn't there to keep them in line.

This is a valid assumption for some employees. But for these cases, the more fundamental question is, Why did you hire them in the first place? The best employees are people who know what they're doing, can communicate effectively with boss and coworkers, and are disciplined enough to complete an assignment without much direct supervision. That is, they are ideal telecommuters. My experience has been that most telecommuters become even better organized and more focused on results because of their telecommuting. This, and the fact that the rate of interruptions goes down dramatically, is the core of the performance improvements

seen in telecommuters.

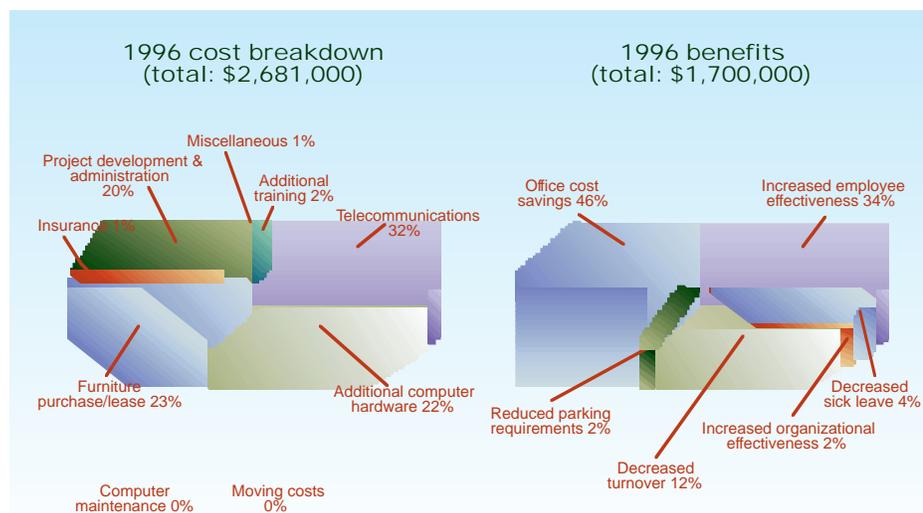
On the other hand, not everyone is suited to home-based telecommuting, even part-time. Some people need to be near fixed files or equipment (like the mainframe). Others don't work well without daily social contact. In many cases, these people will still work well in telework centers. IS managers typically have many unheralded telecommuters, such as systems analysts who respond to 2 a.m. crashes and programmers living in the boonies. The Travelers Companies began their telecommuting program in the mid-1980s to have access to some talented programmers who lived too far away for a daily commute to the Hartford, CT, headquarters.

Team Spirit

One of the next most common concerns about telecommuting is that teamwork will suffer. The notion of teamwork, or group productivity, is gaining prominence as companies deal with evermore complex business environments. To assess the impact of telecommuting on teamwork, it is important to step back and review the process.

Most teams go through a regular series of interaction cycles as they pursue their goals. First is the team startup period. Here, it is usually necessary for the team members to get together physically as they define the team goals, allocate responsibilities, and assign individual tasks and objectives. The need for face-to-face interaction comes from the fuzziness of definition of these tasks at first. It's possible that some form of electronic conferencing can work even in these situations, but the usual approach is to suspend telecommuting then.

Once the assignments have been made, however, the key productivity enhancer usually is solo work, which can be done better by telecommuting. Further team meetings may be necessary to review progress at milestones or to revise objectives, but often even these meetings can be done electronically. The point is that both meetings and telecommuting should be used when they are the best productivity producers. One team of programmers for the City of Los Angeles won a performance award by producing in three weeks of telecommuting a program that they hadn't been able to organize for more than a year. The reason? "Telecommuting allowed us to get the uninterrupted time to think about the problem," says one team member. "We communicated



In an actual implementation, one-year costs and benefits of turning several hundred employees into telecommuters have been identified as above. Source: JALA International

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with each other by phone at least as well as we would have in the office.”

Training and Helping

To make this new model work, telecommuters and telemanagers need two types of training. First is the technology training that aids them in communicating with each other and with the rest of the company and customers. If you are introducing new technology, such as ISDN services, along with telecommuting, this training is especially important. The telecommuters should be made aware that they are more likely to be on their own while telecommuting and consequently more alert during the training sessions.

Equally important, and even more so for supervisors, is management training. Both telecommuters and telemanagers need to know the basics of working together apart. Topics to be covered include estab-

lishing goals, recognizing results, setting schedules, communicating effectively, getting organized and managing time. Our years of testing telecommuters and telemanagers make it clear that this training can be critical to success.

An effective help desk is more important to telecommuters than to people in the office. Repeated surveys of telecommuters have shown us that there are two prime sources of help in most organizations: the help desk and the local guru. Naturally, the local guru is no longer local in a telecommuting situation, so the help desk is often the only source of support. Yet telecommuting can often hasten the learning process, to everyone's benefit.

For example, one local guru was constantly being asked by coworkers to help them solve one computer problem or another. Usually they forgot the solution within minutes after the guru left their desks. Since the guru was getting paid for

other things, this had a negative effect on his productivity, and the forgetful coworkers weren't improving either. The crunch came when the guru became a telecommuter; he no longer was available to repeat their fixes. Within a few weeks the coworkers learned what the guru had taught them. Both guru and coworker productivity improved.

Payoffs and Costs

Beyond the qualities mentioned above, there are bottom-line motivations for an adopting company. Our research indicates that the productivity of successful, one-or-two-day-per-week telecommuters averages 5 percent to 20 percent higher than their nontelecommuting colleagues—as measured by their supervisors. Telecommuters use less-to-no central office space or less expensive space, depending on how often they work at home and/or at a

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telework center. Ditto for parking space. Many organizations, such as IBM, Digital Equipment Corp. and the State of California, have adopted telecommuting on the basis of space savings alone.

Telecommuters tend to take less sick leave than nontelecommuters, typically two or more days per year. They are more loyal to the company; turnover rates are reduced, often dramatically. (In my first telecommuting project—in 1973—the turnover rate went from 30 percent to zero. More generally, 20 percent or greater reductions are common.)

The productivity of their stay-in-the-office colleagues also goes up, due to generally improved organization. Finally, many companies are in urban areas where air quality regulations mandate reduced car use. Home-based telecommuters usually do not use their cars for commuting or anything else while they're working. Traffic congestion is reduced, energy is saved and air quality improves, so the community benefits. We have found that, added together, these produce a typical net annual benefit of from \$6,000 to \$12,000 per telecommuter for midlevel employees.

There are two primary cost areas for telecommuting. The first is *startup costs*: planning, selection, training and technology implementation. The second is *operating costs*: mostly telecommunications charges and equipment maintenance. Most of the long-term costs of telecommuting are in the domain of IS, if you include telecommunications in that category. Additional computers, docking stations, telecommunications hardware and software (and their installation) tend to be the dominant up-front costs for large telecommuting programs. The primary additional costs are for training and implementation project management.

The computer question is an important one. Foremost is the decision as to who's buying. Most government agencies in this era of tight budgets restrict telecommuting to those who can provide their own PCs at home. Most private companies provide the computers for their employees. Usually it is not necessary to duplicate equipment. Full-time telecommuters simply move their computers to the telecommuting location. The majority—those who split time between a telecommuting location and the office—may use the option of laptop and docking station, so the duplication tends to be in monitors and docking stations rather than entire

systems. Where LAN-like performance is a requirement, add the installation costs of ISDN lines.

Telecommuters get some financial benefits as well. These include reduced operating costs for their cars, fewer trips to the dry cleaners and less expensive lunches. But the most important benefit, repeatedly told to me by telecommuters, is stress reduction. That comes from eliminated commutes, of course, but also from the huge jump in work continuity (interruption hiatus). Telecommuters are able to fit their work into the rest of their lives, instead of vice versa.

Making It Happen

Successful telecommuting programs tend to have three main phases: planning, demonstration implementation and rollout. Each has important implications for IS managers. Rule One is to have upper management support, preferably among several upper managers, before you begin. These managers need not be telecommuting enthusiasts, but they should be willing to give objective reasons why they will back expansion if the demo is successful.

Because telecommuting does not necessarily come naturally to all employees and may require system design changes if computers are to be networked, plans for both the demonstration and rollout phases are imperative. A primary function of the planning phase is to establish success criteria, performance measures and preliminary policies for telecommuting. That is, did we do well, and how do we know?

For the demonstration phase, the key objectives for IS are establishing the networking functional and technology performance requirements, scheduling and costs. If your company is thinking of introducing telecommuting on a broad scale, it is important to include a representative sample of organization units in the demonstration. Some units may need extensive technological support, others little.

Make sure those niggling details are considered, such as transparent (well, glitch-free) access to the department network by laptop-equipped telecommuters. If you're using a groupware product, make sure that it will support these remote users. Try not to implement new forms or scripts at the same time the demonstration participants begin telecommuting; you want to be able to separate telecommuting from technology adapta-

tion problems. A key cost factor is the contention ratio—in this case, the number of telecommuters divided by the number of telecommunications ports required to serve them. The belt-and-suspenders approach would have one port per telecommuter, but ratios much higher—and less costly—than that might suffice. They may also help to constrain the security concerns.

Once the plan has been made as bulletproof as possible, the technology is in place and all the participants have been trained in both technology use and management practices, you're ready to go. The demonstration phase should be used to fine-tune the technology and training needs and to provide critical data for the rollout. Don't be hasty. Telecommuting requires some adaptation time. I usually recommend at least a year for the demo; nine months is the minimum. Too many things are still in flux in the first several months after implementation for reliable follow-on decisions to be made.

The demo phase is also the time for assembling the core of the rollout plan. In essence, repeat the processes of the planning phase, but refine the numbers with the data derived during the demo. Central to this task is the help desk. Make sure that the help personnel realize that this is an important project, give it full support, keep careful records of the problems that come up and report them immediately to the implementation team.

Telecommuting works and works well when properly implemented. Conversely, poor planning and failure to get management's backing can be dangerous to your career, if not your health. If your actions can result in a net annual benefit to the company of, say, \$8,000 per telecommuter, you may deserve a hero button, if not a percentage. Even better, you may actually get recognition for being a stellar innovator. Besides, if you become a telecommuter yourself, you may be forced to figure out what to do with all that newfound discretionary time you have. **IT**

Jack M. Nilles, who coined the terms teleworking and telecommuting in 1973, is president of JALA International, Inc., and author of *Making Telecommuting Happen: A Guide for Telemanagers and Telecommuters* (Van Nostrand Reinhold, 1994). He can be reached at jala@ix.netcom.com.