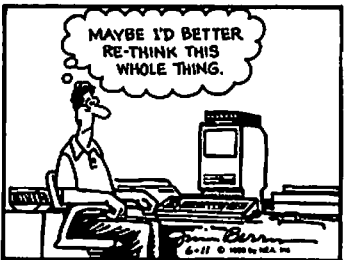
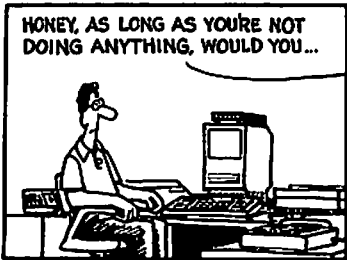
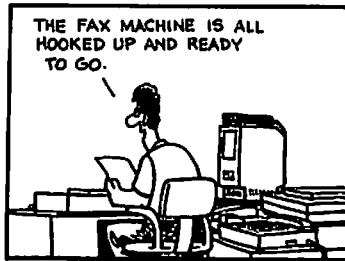
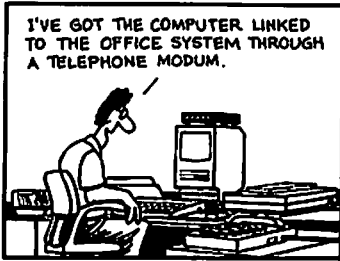


eighteen-month period, this accounts payable supervisor became the office guru on desktop publishing and color graphics because she had joined ChocolateLovers. These skills were not directly applicable to accounts payable supervision, but they represented an increase in her skill repertoire and an increase in the skill capacity of the entire office.

5.3 Conclusion

It may seem paradoxical that computers, stereotyped as cold and impersonal, can be used to increase personal connections and affiliation. Electronic communication is not a substitute for face-to-face relationships, but for many peripheral employees, satisfying face-to-face relationships are hard to come by in the workplace. Electronic communication can increase the informational and emotional connections of these employees. The benefits to individual employees are immediate. The organization can additionally benefit by increasing employee capacity to work beyond the letter of the employment contract.

From the organization's perspective, giving a voice to the voiceless and opening a window on the corporation can produce bad effects as well as good ones. If the previously voiceless employees use the mail system to complain or to mobilize protest, managers might prefer that they had remained mute. And even if increasing participation by electronic means does not lead to riot or revolution, it still costs money. Some managers may be unwilling to support communication services that are not directly tied to task performance even if they do increase employee motivation and commitment. That decision, however, is one that should be taken in the light of more general human resource strategies.



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Those who control information derive power and influence over others from their position of control.¹ New communications technology can change the balance of information control in organizations. A city manager told us that electronic mail causes too much “upward delegation.” “I love it,” he said, “but employees send me their problems. I want to give them assignments, not the other way around.” Before the network was installed, people who wanted to meet with the city manager left a telephone message, made an appointment with his secretary, or waited for his open office hours. Procedural and human gatekeepers buffered the city manager from problems he didn’t want. Computer-based communication technology made it possible to bypass traditional information gatekeepers, thereby leading to a change in who had influence.

In this chapter we examine patterns of power and influence that can result from computer-based communication. Any technology, if it is a valuable resource, can become an instrument of power. Computer-based communication technology differs from many other workplace technologies because it has more potential to support upward influence and lateral influence, not just downward management control. The first part of this chapter briefly describes the development of communications technology as a controlling element in modern business organizations. Next, we consider how electronic communications can change the balance of information control—and people’s power and influence over one another. We look at responses to these changes and how management can alter policies or technology design to reassert its control. Then we consider some complications of increases in information control. Finally, we apply these ideas to an increasingly important phenomenon in organizational life: the remote worker.

6.1 Information Control and Systematic Management

Before the middle of the nineteenth century, information and power in organizations were right at hand. Because firms were small and run by a single individual or family, people got their information—and their influence—by just talking with others. Beginning about 1850, the spread of manufacturing, transportation, and communication technologies expanded markets, leading to a growth in the size of firms and to organizational differentiation. Experience soon showed that informal conversation was inadequate for larger organizations run by managerial hierarchies and competing in expanded markets. A theory of management, later called systematic management, developed in response (Litterer 1961). The theory advocated formal, standardized, and impersonal procedures. System was supposed to substitute for ad hoc decision making and incidental oral communication. Formal communication methods, such as the printed circular and weekly performance report, and new technologies, such as the typewriter, stencil copier, and vertical filing cabinet, played a big part in systematic management. Each was designed and operated to control workers, materials, and production processes on behalf of management (Beniger 1986; Yates 1989).

E. I du Pont de Nemours and Company exemplifies this rise of system and information control (Yates 1989:201-270). Du Pont manufactured only one product, gun powder, during the nineteenth century. Beginning in 1902, the du Pont family took over most of the explosives industry and rapidly expanded the firm, devising at the same time a complex and extensive formal internal communication system, mainly based on writing. Management communicated down the hierarchy through circulars, manuals, and memoranda to give instructions and impart policies. It required upward communication through regular reports and performance statistics to monitor and evaluate employees. It used lateral communication through memoranda, and also telephone and telegraph, to coordinate and document interactions. (By 1919, the mail department handled 5,500 pieces of interdepartmental mail daily within the Wilmington headquarters.) Meetings formalized and documented conversation to gain cooperation and maintain morale. Written documentation, kept in filing cabinets, formed an organizational memory to ensure consistency across time and units. The company developed statistical analysis and graphing techniques to aid data compression and analysis; treasurer F. Donaldson Brown

devised the return-on-investment (ROI) formula for using financial statistics. In time, so much information came to the executive committee that it became overburdened with information and analyses. One response was du Pont's chart room, equipped for displaying graphs from huge metal racks hung from the ceiling (Yates 1989:266). All of these procedures, arrangements, and technologies had the purpose and effect of tightening management control over operations and interactions among du Pont employees. Even the employee newsletter, meant to humanize the workplace, was crafted to reinforce managerial values and aims.

The design and use of communication technology at du Pont was not atypical. From ancient times to the present, new communication technologies have served the status quo and have been administered under the authority of elite gatekeepers.² Egyptian scribes wanted to keep writing for themselves as an elite skill. The first printed books were versions of existing manuscripts selected by Christian gatekeepers. The French telephone system initially was accessible only to municipal officials and other elites. Limited accessibility is still true of communication technologies in China and the Soviet Union (box 6.1). Not surprisingly, people often resist changes in information control that diminish their position. At du Pont, routine reports meant to monitor and control operations were a constant source of conflict (Yates 1989:245-246). Headquarters complained about the inaccuracy and lateness of reports. Superintendents in the plants saw the reports as so much red tape. More important, reports took away power

Box 6.1. Bread and circuits

Technological innovation can thrive only in an environment that invites, or at least tolerates, dissent. Technological innovation is largely a process of imagining radical alternatives to what is currently accepted and sharing these new possibilities with others. Problems must be openly recognized and ferment must be generated among creative minds to find solutions. But these are, in effect, acts of subversion. They almost invariably stir things up. And no clear boundaries exist between different categories of imagination, between different realms of subversion. The scientific, the managerial, the economic, the philosophical, the cultural, the political: they have a way of running into each other. It is no accident, as the Marxists used to say, that many of the Soviet Union's most brilliant scientists and artists are also political dissidents.

Moreover, many of the new technologies are themselves subversive. Computers, word processors, and telecommunications equipment not only incite unorthodox ideas, they also allow them to be exchanged instantly. They inspire communities of dissent. Totalitarian regimes understand this; they monopolize

the technologies of communication—the press, radio and television, telephones, and now the computer. Nothing threatens a police state's legitimacy more than private and robust debate; nothing assures its survival more than the isolation and fragmentation of the citizenry.

. . . These ironies lie at the core of [Mikhail] Gorbachev's dilemma. For more than a half century, the Soviet police state has maintained tight control over communications among Soviet citizens. Even today, senior scholars and scientists are loath to use copying machines: in most enterprises and universities, copying departments are staffed by the KGB. How, then, can the Soviet Union be expected to adapt technologies that will unleash so much communication? How could the Soviets embellish and improve upon the new technologies without simultaneously inviting political and social dissent? To gain technological sophistication, Soviet economics and politics would have to be transformed. This the Soviet bureaucracy will not allow. Technological sophistication is essential to the Soviet Union's economic and political survival. Technological backwardness is essential to the Soviet Union's system of government.

Source: Robert B. Reich (1987). Bread and circuits. *New Republic*, 197(5), (August 3, pp. 32–33). Review of Marshall I. Goldman (1987), *Gorbachev's Challenge: Economic Reform in the Age of High Technology*.

from the superintendents since plants could be compared against each other, and executive decisions about resource allocation could be made on the basis of this information. As Yates noted, "The upward reports, like downward communication, shifted power from the superintendents to the main office. It gave the main office the information necessary to evaluate the efficiency of one plant against another and to make decisions about where to locate production. And indeed, the efficiency of the plants was improving, so the systematic management that headquarters was imposing in part through these reports was paying off" (p. 246).

6.2 Computers and Information Control

If we had visited du Pont forty years later, the by-now-giant chemical company might have evidenced similar frictions over computer technologies. In the 1960s and 1970s, mainframe-based computer technologies were intended to reinforce managerial control. The special units that managed information technology put barriers between people and corporate information. Information technology personnel seemed more interested in their computers than in the needs of employees (Danziger 1979). The emphasis on standardized, numeric data reinforced performance measures chosen by management (Ridgway 1956; Markus and Pfeffer 1983).

But not all technologies reinforce managerial standards and control. The telephone initially began as a technology for businessmen to give orders and monitor performance, but it also made possible lateral communications among coworkers, which changed interpersonal relationships and control patterns. Computer networks also were viewed initially as a way to increase centralized control; with computer networks, managers could extend their authority across time and space. This view changed, however, as personal computers enabled people to control their own work and analyses. People realized how easy it was to talk informally or share data with anyone (or with everyone) on the networks. In this respect, computer-mediated communication seemed much like the telephone, which to a degree also permits open, informal interaction. So far computer networks have allowed broader access to information and a decrease in the power of traditional gatekeepers. The process can lead to conflict, though, as people who have power seek to protect their position. This conflict is apparent today in some computer-based communication systems and helps explain some second-level reactions to these systems.

(1) Who's In Charge Here?

- A brokerage firm introduced electronic mail between customers and their brokers to speed up the transmission of information that otherwise would be done in more time-consuming, conventional ways. Customers felt more comfortable asking questions electronically because they knew they weren't interrupting the broker with a telephone call. They felt their access to the broker grew by this technology and they became more active participants in the relationship. Brokers, in turn, felt they could process customer questions more efficiently and used the "saved" time to sell new accounts (Hirschhorn 1985).
- The Social Security Administration introduced an interactive claims processing system to reduce the amount of time necessary to decide if a client's claim was authorizable. With the new system, clients provided information to case workers, who immediately entered it into the networked system. The system analyzed that information fast enough so that case workers could learn the determination and pass it on to clients while they waited (Turner 1984).
- Police officers who previously radioed their dispatcher for information on suspicious persons or vehicles now use a terminal in their patrol cars to interrogate databases directly. They get information much more rapidly with this technology, an important benefit when trying to decide if a

suspicious person or vehicle should be stopped for interrogation (Palys, Boyanowsky, and Dutton 1984).

In each case, the designer's intention to increase the speed of information transfer—a first-level technology effect—succeeded. Unnoticed and unintended by the decision makers who authorized the new systems, each also changed the balance of information control among the parties who used the systems, a second-level social effect. Network-based communication technology can change patterns of information control by allowing people to bypass gatekeepers and access information sources directly. Typically this results in not only a faster flow of information but also changes in the relative power of the parties in the transaction.

In the brokerage firm, both brokers and clients apparently benefited from faster information exchange with the new technology. But there is more to the story. Network communication changed the relative balance of control over information by giving customers a greater relative share of access to important information. Because information about their accounts' activity was on-line, customers could now assess their broker's performance in a detailed way. Brokers felt more vulnerable to customer scrutiny, knowing that their daily performance could be compared against that of the market as a whole. Because the firm's on-line research bulletin was also accessible by customers, brokers no longer were the sole gatekeepers for research information.

In the old social security claims system, a client provided the claims information and had to return days later to learn if the agency had authorized the claim. Officials assumed that everyone would like the new system better. It was easier to use and provided information much more rapidly than did the old system. In reality, case workers did not like the new system at all. They made more errors and reported that they felt much more stress with the new system. The new computer system degraded the nature of the social relationship between claimant and case worker. In the old system, case workers did not have to confront claimants directly with the news that they were denying (or accepting) the claim. Often claimants did not hear the dispensation of their case from the same worker who recorded the initial information. Even if the same worker both recorded the initial information and later gave the returning client bad news, enough time had intervened that the interaction could be dispassionate, at least for the worker. With the new system, the case worker had to record information and then immediately tell the claimant that the claim had been denied (or

accepted). What officials saw as time delays in the old social relationship were really time buffers that allowed case workers and claimants to interact with little stress. The increase in stress emerged from the changed social relationship between case worker and claimant, not from some property inherent in the new technology. In this situation, technology fixes, such as improving the command language, the user interface, the documentation, or the training, would not change the new social relationship. They therefore would not eliminate the stress.

The police officers who no longer had to depend on dispatchers for information were happy with their new system because it gave them more control over information access. Under the old system, all radio calls to the dispatcher could be heard by all other police radios. Thus a patrol officer's peers always knew where he or she was and what kinds of information he or she was asking for. Dubious requests were often the butt of jokes from other officers. The requests were also audible to the dispatcher, of course, who might challenge dubious ones or keep the officer waiting before filling them. The police officers liked the new system because it gave them more control over information; the dispatchers disliked it intensely, for it reduced their control.

In each of these cases, a technology introduced simply to speed up the transmission of information led to changes in who had control over information and expertise. These changes made old social relationships much more fragile and problematic. Changes in control over information led to changes in job performance. Those who lost control over information became dissatisfied but were unable to demand the abolition of the new systems because of demonstrable performance gains. Also the "losers," while generally of higher status than the "winners," were only mid-level employees, without the hierarchical power to abolish such systems. In other cases, when electronic communication changes the relative power over access to information, the potential "losers" have been senior management. When hierarchical control of information is strong and information exchange follows strict channels, computer networks and widespread electronic communication have the potential to undermine long-established patterns of management control. The predictable reaction of top management under these conditions is to reassert control.

Zuboff (1988) describes such a case in a large pharmaceuticals company known for its narrow, highly structured channels of communication. As an internal report from the company said, "Specific information about the

way the company and each division are organized is carefully controlled so that employees in one division may not have a clear picture of other divisions or the company in its entirety. Official communication is handled hierarchically . . . There are periodic warnings about only sharing information on a 'need-to-know' basis" (pp. 366-367). This company installed a computer-based conferencing system that, by 1982, had 2,400 participants. In 1983 employees began a conference titled "Women's Professional Improvement," which described its purpose as "helping professional women cope with life in a male-dominated corporation" (p. 382). It quickly became very popular, with 130 members sharing information and advice electronically. But members of the management hierarchy began to feel threatened. The personnel department feared that women employees might use the conference to organize a union. The legal department feared that the conference might become a vehicle for initiating affirmative action suits. In each case, a hierarchical unit that previously controlled access to information saw its control slipping away. After management complaints, leaders of the conference were cautioned to rein in the discussion and focus it only on "legitimate business issues," that is, ones that did not threaten the hierarchy. The complaints and cautions had a chilling effect on the conference: membership declined, and free exchange of information decreased. Hierarchical responses like this one ultimately led to a refashioned computer-based communication system. According to Zuboff, "everyone involved agreed that the new emphasis was one of formality, self-consciousness, and self-protection" (p. 384).

In the pharmaceutical company, executives clamped down on communication in the name of legitimate business practice. But the women's discussions were not bad business. Officials were more concerned about control. Suppose they had let the group prosper? An electronic interest group of women might decide that women would fare better in the firm if they mobilized as a group. They might use the network to solicit support from disaffected individuals and try to influence management policies. Other groups might see this and become encouraged to also try to influence policy. Any of these behaviors could threaten management control.

12) A World Worth Talking About

Open communication leads to unsupervised information sharing. In electronic conversations employees might discover more about company policies and practices than management intends them to know. For

example, if salaries are kept secret, connected employees can compare salaries; they can compare the size of their offices; or they can ask who has and has not been consulted on a major decision. Organizational authorities often try to keep staff content by convincing them their share of resources or influence compares well with that of others, even if it doesn't. To succeed in this, they have to control access to the information that might be used to make comparisons among people or subunits. For instance, a large engineering firm forbids its professionals working on different projects to talk across the network about anything other than specific technical information used for their projects; project teams are not allowed to discuss and compare performance evaluations received by each team, for example. The justification for this policy is that it protects everyone and permits impartial treatment. In another case, a financial services company installed a separate local area network for each of several functional subunits. Electronic mail does not move between the networks. The company's justification for this design is that confidential information must not go inadvertently to inappropriate people.

Restricting communication and secrecy are control strategies in these companies (Pfeffer 1978). In the case of the engineering firm, project members develop a notion of how much commitment management should make to their projects in terms of expertise, funds, time, and other resources. If comparative information about how management is treating other projects is unavailable because of project secrecy, then the employees can't make a good evaluation of their treatment. They must test the organization's commitment either by looking outside the organization or relying on the judgment of the organization. Secrecy allows the organization to discriminate more in its distribution of resources and rewards to different projects than it could otherwise do; it permits concentrating resources in some projects and giving only minimum resources to others.

In the case of the financial services company, compartmentalizing the networks helps protect the integrity and confidentiality of data. It prevents employees in different units from trading data and discourages formation of electronic groups across physically separated units. Security officers have an easier time preventing illicit communications when networks are compartmentalized; an interconnected open network is full of headaches for them. In the ideal world of the security officer, nobody talks with anybody. In such a world, however, no one does much worth talking about.

6.3 Social Control

As the women's interest group in the pharmaceutical company illustrates, open communication among employees usually does not threaten management's direct control over performance. It can threaten management's social control of the workplace. Social control is a more subtle way of controlling behavior than the reporting requirements, formal communications, and other systematic management techniques used in performance control. Social control entails imbuing workers with a sense of "the way we do things around here" and a desire to excel. It also entails maintaining appropriate relationships among people, fostering the feeling that "we are the company" and should work as a team. Organizational culture can promote social control through such devices as company rituals and war stories (Martin 1982; O'Reilly 1989). Electronic communication can promulgate cultural values. But if people communicate openly across the organization and management has little control over what they say or how they organize these communications, social control tends to divide more unpredictably between workers and management. Electronic communication does not change the total amount of social control but can be used to change who has social control and the kinds of behavior regulated by social control.

Social control in electronic mail is illustrated by this message from an electronic interest group called SportsFanatics:

Hey fellow Fanaticists,
 Working here at Corporate Headquarters is no picnic with all of the political "bs" and red tape that sometimes goes around. However, I am occasionally privy to some information that y'all may not hear. For one, there is a process underway that would do away with all of the nonbusiness electronic groups that currently reside on our net. The folks involved seem to think that these groups tie up mail servers. Not to mention the point they make about the time spent corresponding over these types of groups not being very productive. I think all we SportsFanatics can agree that we enjoy most of the topics discussed here and we don't want someone "upstairs" to pull the plug. If you don't think the threat is serious, it is. It's been elevated to a VP level, and they're looking for more justification and a practical method for deleting these groups..... Big Brother is definitely watching...believe it! . . .

Although this message complains about top-down control in the organization, it reflects social control at the employee level. The person who sent

this message was part of a large group that had nothing to do with the hierarchical structure or with the work of the company. The topic was not business. Yet the sender had a claim on the attention of many other employees. In this message he exhorted his group to forgo “petty bickering” and “cheap personal shots” in electronic mail group messages. “Let yourself cool down before answering that mailnote that put down your favorite team,” he urged. “If we act like responsible people and not like a bunch of goons, we may be allowed to keep this electronic group going a little longer.” In other words, if the group behaved itself, it would retain some control.

Alliances are the primary vehicle of social control. Employees frequently find they have experiences, anxieties, and attitudes in common, a discovery that leads to the development of reference groups, that is, groups whose opinions people respect. Employees conform to the norms of these groups and reject people who don't conform. Group rewards are conferred on those who achieve according to the group's criteria of excellence (Kiesler and Kiesler 1969; Weick 1979). It is no wonder management would like to control reference groups and the cultures they promulgate. Unintended social control is exemplified by the emergence of “gripenet” at IBM. When that firm initially introduced the computer network, VNET, lower-level managers and staff used it to publish an underground electronic newsletter. They discovered they shared many concerns and problems and used the newsletter to argue about management policies. Top management became alarmed and instituted a new policy restricting access and content in the network, and it even began monitoring network communications (Emmett 1982).

Social control is intimately connected with participation. The more people participate in organizational affairs, the happier they seem to be, and the more they feel they can influence others. In chapter 5 we described how city employees on shift schedules used electronic mail to increase their participation in city government. For example, by making it possible for a police officer to advance her views of a promotion even though she was on the night shift, her potential influence on her department was improved, and she felt more solidarity with her coworkers. This would have increased their potential influence on her too, of course.

Yet there is also potential for more friction as social control increases at lower levels. One study showed that in software development teams, the more participation and influence staff professionals had, the more disputes

there were over policies and practices (Robey, Farrow, and Franz, 1989). At our university, the administration once proposed a new policy governing the ownership of intellectual property. The news spread on the computer network, leading to the following message:

I cannot resist fanning the flames of discontent. Under the kindest interpretation, the motives of the administration were to view the intellectual properties issue as an adversary conflict, and send up a trial balloon taking an extreme hardline stance. Then, any amount of yield gives a false appearance of conciliation...regardless of whether their next proposal is almost as ludicrous as the present one. It is also possible that the administration actually means to ram through their policy with minimal notice or comment....I propose we draft a statement

This message elicited answers from thirty-five people in two days, mobilizing an effective opposition to the administration's policy.

Electronic groups greatly extend the possibilities of upward and lateral social influence. The messages to the SportsFanatics group and to the group of professors at CMU are not very different from similar messages that could be given in person, but each was sent to hundreds of people, most of whom the writers had never met. Ordinarily we pay little attention to people we don't know and know little about; however, by virtue of their membership in the network community, the writers had legitimacy. Many readers responded who would never have heard about the problem without the network. Participants in electronic communities report that on occasion the network erupts in flaming and public debate over a matter that would have received no attention in the past. An inflammatory remark or gossip receives wide electronic distribution, fanning discontent or even collective action by employees (Emmett 1982; Stoll 1989). In some high-technology organizations, employee-initiated and highly participative debates ensue over issues ranging from what computers to buy to what reorganization plan is best to what is a proper C.E.O. salary. The labor market in high technology is such that valuable employees can demand participation as their right (Sitkin forthcoming; Hybels and Barley 1990).

6.4 Complications of Information Control

Changing patterns of information control can result in second-level complications that cannot necessarily be solved by better technology designs or policies. Control leads to fundamental organizational conflicts. Technol-

ogy design and policy can affect the conflicts but not eliminate them. How a company views the legitimacy of information exemplifies one basic pattern. Organizations value what they measure (Pfeffer 1978; Kiesler and Sproull 1982). For instance, standardized financial information that bears on profit-making objectives can dominate attention to the exclusion of equally essential but less legitimate information such as information about employee morale. If computer-based communication technology were used periodically to collect and distribute data on employee job satisfaction, it would not change the organization's response to legitimate information. Yet it might lead to a new basis of legitimacy for data about morale.

(1) **Information Overload**

One unintended effect of widespread information control is information overload. If members of a large unit send their progress reports not just to their supervisors but also to coworkers, and those readers reply to the writer and forward comments to other employees in the unit, interpersonal influence increases. So do the demands on people's attention (Hannaway 1989). Because who gets attention has symbolic and task importance, people in an overloaded system may escalate their requests to be noticed, thereby increasing overload even more (Thorngate 1988).

Often information overload is really an argument about control. Complaints about information overload usually come from recipients rather than senders of messages and apply to burdens unwelcomed by recipients. Recipients reject information they do not want by claiming they are overloaded. Typically the problem is not too much information literally but lack of control over information exchange. People usually prefer communications they initiate themselves, and they prefer to have choice in the content and format of information they send and receive (Thompson 1981). Choosing what to learn can produce a better match of information to task than can be accomplished when information is selected by others. Also, if information is valuable, then people want the freedom to negotiate its exchange. Elites usually have more control over their communications than do other organizational participants. Yet the sheer amount of communications they engage in voluntarily is larger, belying overload as simply a problem of volume. Some electronic mail systems let people build filters for their mail so they can control what they see (Malone et al. 1987). Such systems typically let people specify what should come through the filters (all mail from the boss, all mail with "URGENT" in the subject field).

The filters delete all other messages or place them in a lower-priority folder. If such filtering systems are useful, it probably is because they give people a sense of more control over their mail. The difficulty with such systems is that they can greatly reduce the amount of new information (some of it worthless, to be sure) and new contacts (some of them useless, to be sure) that people will encounter electronically. (One way around this dilemma is to establish a filter that lets through a certain fraction of the low-priority mail every day.)

(2) Illusions of Control

In principle, physically dispersed organizations with good communication links can delegate responsibility widely (Kraut 1987; Becker 1986). One reason is that there are fewer physical limitations on the number of people a supervisor can handle. Yet good communication links also provide an occasion for superiors to exert control. A complication of information control is that it can give distant superiors the illusion that they know enough to act at a distance, though they cannot capture all of the knowledge available to those on the scene (Fischhoff and Johnson 1990). Before the invention of the telegraph, diplomats had considerable autonomy once they landed in a foreign country. With the installation of the international telegraph, officials in the home country monitored and gave orders to nineteenth century diplomats well beyond the actual information they received. Military command-and-control systems are said to provide commanders with six-thousand-mile screwdrivers. The counterargument is that the canny distant actor can use technology to manage what the home commander knows (Metcalf 1986).

(3) Misinformation

Communication is partly a strategic exercise through which people define, protect, and pursue their interests. They misrepresent and disbelieve information in ways that are advantageous to themselves and their groups. Beau Sheil (1983) describes his attempts to describe precisely the office procedures used in a branch sales office of his company as a preliminary step to designing an automated system. It turned out that the procedures were precise and rational only on the surface. Office workers would give different people different information according to the different impressions they wanted to give. By controlling the impressions they gave, office

workers caused others to interact with them in ways they found advantageous. For example, sales representatives were told about a phantom procedure in their head office that took much longer than the actual one did. The purpose of the phantom procedure was to justify requiring the sales representatives to begin their interactions with the office workers well before their actual deadlines. Sheil argues that the office workers' distorted descriptions of their procedures were not a sign of stupidity or resistance; the office workers were controlling the procedures that affected the rest of their work lives.

Technology and technology policies that assume everyone shares or wants to share accurate information can generate new problems that did not arise with more organizational ignorance. Other things equal, if groups send and receive accurate and complete information, they potentially compromise their strategic positions and threaten the balance of control in the organization. Senders, knowing this, misrepresent information. Recipients, knowing this, discount information. Simply increasing the rate and scope of information sharing might only increase the number of misleading and discounted communications.

6.5 Controlling Remote Workers

All remote workers—traveling salespeople, forest rangers in the wilderness, professionals working at home, and others—pose problems of control for employers. If the outcome of remote work can be measured unambiguously, then control of performance can be attained by establishing quotas, such as sales volume or new accounts landed. Agreed-upon quotas influence behavior and control performance while the employee is operating remotely. When employers cannot measure performance outcomes easily or unambiguously, they may try to establish standard behaviors. For instance, are predator-sighting reports up to date? Are fire-watch towers properly supplied? Here behavioral standards control performance while the employee is operating alone. For many workers, particularly professional or white-collar workers, both outcomes and behaviors are hard to specify. Then employers must rely on social control, employees' understanding of "how we do things around here," and commitment to "what it takes to do a good job." Organizations instill these internal beliefs formally through training programs, policy manuals, and supervision, and

informally through social interaction—watching other people, exchanging war stories, and general conversation.

Network communication makes it possible to increase the efficiency of remote work, both on the road and at home. With portable or personal computers and dial-up connections, remote workers can be in immediate touch with the office, whether to access up-to-date databases, to submit orders and reports in a timely fashion, or to send and read electronic mail. While all remote work benefits in principle from electronic communication, portable computers on the road are much more popular than is computer-supported work at home. Differences in control, we think, explain part of the difference in popularity. Before they used computers, employees such as sales personnel or off-site auditors had only tenuous connections with their colleagues and managers back at the office. Computer networks can increase those connections dramatically. By contrast, people working in an office setting decrease their connections with others if they stay at home and work only via computer. Social control and influence increase both for managers and for workers who use computer networks on the road and decrease when office workers use computer networks to work at home (figure 6.1).

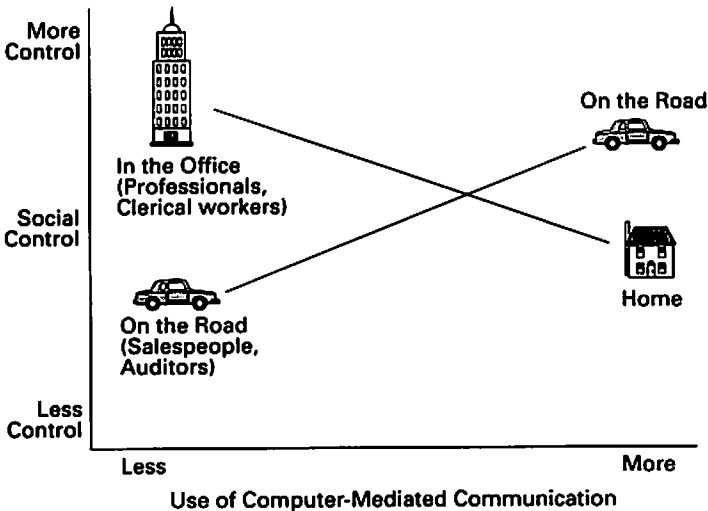


Figure 6.1
Relationship between computerization and social control of work

(1) On the Road

About 2 million portable computers were sold between 1986 and 1989. As one analyst noted, they process information about everything from “corn niblets, multiple vitamins, frozen fish, dead moose, gasoline supplies and prices, corporate profit and loss statements, [to] Alka Seltzer” (Halper 1988). As stand-alone machines for small amounts of data entry they are very useful, but their real power comes from using them to connect to mainframe databases and through electronic mail to other people. The two largest groups of people who use these machines are sales workers and auditing and accounting personnel. Sales workers appreciate the convenience of using a portable computer instead of having to haul around heavy notebooks of product information and paperwork. Using telephone lines, they can access and download up-to-date databases while they are at customers’ sites. Miles Laboratories’ consumer health care division, for instance, equips its sales force with portables that let the salespeople access electronic mail, customer files, sales progress reports, and order status information and forms for reporting assessment of sales calls. Accounting and auditing personnel who work at client sites also appreciate having access to standard forms, analysis packages, and up-to-date regulations without having to carry around heavy volumes. In each case, the first-level or efficiency effects are obviously positive. Also in each case, formerly isolated workers can now talk directly with one another and with colleagues back in the office via electronic mail. This gives them the opportunity to share in informal conversations and exchanges of information that help build commitment to the organization and foster social control.

At the same time, computer links between the office and employees on the road can increase supervisors’ performance control (Rule and Brantley 1990). For example, a burglar alarm company used data from each alarm call to check whether the field inspector assigned to a machine had given it its periodic manual servicing. Computerized analyses of sales are a common vehicle for increased control by managers. In the Rule and Brantley study, one employee said of a firm that fabricated steel parts and entered every order into the computer:

The President gets a copy of every order and the order lists the profit margin and dollar profit for every order. Before computers, he simply got the dollar total made on the order (and he got it much later). Now, he is much tougher on the sales people when he sees a low margin. Since he often sees this before the bill has gone out, he will often change the price. He usually gets the customer to pay that price. Before computers, by the time he saw the dollar profit on each order, the invoice had

probably gone out already. He didn't want to issue an additional bill because the customer wouldn't pay it. Also, since he only saw total dollar profit, he might think an order that made \$1,000 was a good order without realizing that the profit margin was only 3%. Now, he sees both dollar and percentage and this leads to keeping better tabs on the sales and salesmen. (p. 11)

Here management control extends to areas where it had been desired but was infeasible without the new technology. By enabling the president to gain access to performance data through the computer, he gained the means to exact more control.

When communication technologies increase the control connections between workers on the road and supervisors in the office the effects need not be positive. Fischhoff and Johnson (1990) give an example of negative effects in the abortive attempt to rescue American hostages in Iran during the Carter presidency. With their modern communication systems, Washington military officials believed that they could control operations at a distance and thus did not give field personnel full authority to act on their own. When they heard that the number of disabled helicopters exceeded the prespecified number necessary for safe operations, officials in Washington stopped the rescue plan. Later it was learned that military personnel on the scene, using local resources and their intimate knowledge of extant conditions, probably could have conducted the rescue with far fewer helicopters.

(2) Working at Home

Although an eight-hour office workday is the rule, eight productive hours at the office are the exception. White-collar workers are particularly susceptible to unproductive time at the office. Constance Perin (in press) notes, "As employees and managers often see it, putting in an appearance at the office is bound to *lower* their productivity and their job satisfaction." She quotes a manager of authors of in-house training courses who says, "I send my people home to get their work done." Also a financial analyst says, "With fewer interruptions I'm more productive at home—I also save the commute time."

Electronic communication and computing technologies now make it possible for many people to work mostly at home, a practice known as telework. The best candidates for telework are clerical employees who do large amounts of routine transaction processing and relatively autonomous professionals such as writers or designers. Analysts have estimated that up