

*This study examined the impact of a computer-mediated communication system (CMCS) on two "high tech" organizations. One hundred and twenty persons participated in semi-structured interviews or completed two critical incident forms. Grounded theory was used to analyze the interviews and the critical incident data, and naturalistic observations were used to provide depth and context to the discussion. The analysis of the data indicates that organizational members tend to give CMCS favorable reviews. However, the data also illustrated considerable variance in how organizational members view the impact of CMCS on interpersonal relationships, message structures, task efficiency, the work environment, and information processing characteristics of organizations. Secondary or unanticipated effects of CMCS are identified and discussed as potentially having a significant impact on organizations.*

## **Techno-Sense: Making Sense of Computer-Mediated Communication Systems**

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A large portion of the research on computer technology has focused on the "instrumental computer" and the kind of work the computer can do. In contrast, Turkle (1984) examined the "subjective" computer and the way it affects our thinking, especially the way we think about ourselves. With a subjective approach in mind, the purpose of this study was to examine interpretations of computer-mediated communication systems (CMCS) and to see how they affect organizational communication processes. Specifically, two organizational environments were examined in an attempt to understand how CMCS affects individual and organizational communication processes.

Historically, business communication technologies have been recognized as a dynamic factor in establishing and maintaining organizational systems (Bernard, 1938; Mayo, 1945; McLuhan, 1962). However, a shift has occurred as technologies such as CMCS have become a cornerstone to the activities of knowledge workers in the information age and the office of the future. More research is needed to understand how new communication technologies alter basic aspects of organizations such as information processing systems, task efficiency, and interpersonal relationships (Brod, 1984; Chilcoat & DeWine, 1984; Hiemstra, 1983; Hiltz, Turoff, & Johnson, 1985; Johansen, Vallee, & Palmer, 1976;

Kiesler, Siegel, & McGuire, 1984; Naisbitt, 1982; Penrose, 1984; Rice, 1982; Rice & Case, 1983; Short, Williams, & Christie, 1976).

The reasons for further theory development and research of CMCS are multiple. First, CMCS hardware and software are developing rapidly, and as they change, the impact of CMCS may also change. Second, creative and innovative applications of CMCS continue to evolve, and one might expect the impact to change accordingly. Third, many organizations are just now reaching a critical mass of users (Rice, 1987; critical mass refers to the full impact of a technology not being realized until widely adopted). Both the content and depth of organizational change may reflect the level of a technology's critical mass. Finally, since organizations require processes of communication, significant additions in the communication system, such as CMCS, may have widespread impact on organizational processes.

Of particular importance to understanding the impact of CMCS is the distinction between primary and secondary effects (Rogers, 1986). Primary effects are anticipated while secondary effects are unanticipated. For example, an anticipated primary effect of CMCS is a decrease in phone tag, while a secondary effect would be those things that occur due to a decrease in phone tag. Secondary effects may evolve due to unexpected, creative, and innovative applications of CMCS. Little has been written about primary effects; however, even less has been written about secondary effects of CMCS.

Much of the CMCS literature has relied on theoretical discussions and quantitative analyses, but relatively few qualitative research studies have been conducted. Recently, qualitative analysis has become accepted as a viable method of understanding business communication processes in organizations (Cochran & Dolan, 1984). Qualitative methods emphasize "deep," "thick," and "rich" descriptions of human experience and perception. Thus one strength of qualitative methods is providing the initial discovery, understanding, and documentation of both primary and secondary effects of CMCS. This study essentially asked the following question, "How has CMCS affected your organization in the following areas: information access and transfer, task completion, individuals' roles and status, and interpersonal relationships?" The literature related to these topics follows.

## RELATED LITERATURE

CMCS may facilitate the improvement in the information processing systems of organizations. For example, CMCS has been related to a more

efficient flow of information up, down, and across organizations (Furgeson, 1977; Katzman, 1974; Pool, 1983; Rice & Bair, 1984; Rogers, 1986; Spelt, 1977; Strassman, 1985); to greater access to information and individuals (both local and remote); and to creating greater access to organizational power, decision making, and creative processes (Gengle, 1984; Kiesler, Siegel, & McGuire, 1984; Rice 1980). Also CMCS has been linked to increases in the amount of information distributed and consumed (Ito, 1981; Pool, 1983; Rogers, 1986); concerns about information overload (Rogers, 1986); increased separation between information poor and rich (Katzman, 1974; Pool, 1983); alterations in organizational structure (Allen & Hauptman, 1987); increased communication activities within functional groups and in superior-subordinate relationships (Rice, 1980); more effective communication with external environments (Rice, 1987); more open organizational networks (Rice, 1987); and a decrease in the amount of face-to-face and telephone communication (Kaye & Byrne, 1986; Sumner, 1985).

Not only has CMCS been related to significant alterations in information processing systems, but (perhaps because of this fact) it has also been related to significant improvements in task efficiency (Quible & Hammer, 1984; Tapscott, 1982). For example, CMCS has been related to reductions in resources devoted to media transformations (Rice, 1987; Sassone & Schwartz, 1986) and time spent in shadow functions and telephone tag (Francas & Larimer, 1984). CMCS has been associated with improvements in planning, promoting timely and complete feedback, controlling organizational activities, managing time, initiating action plans, responding to the environment, planning flexible work schedules, eliminating manual labor, composing documents, and preparing written documents (Rice & Bair, 1984). CMCS has also been related to increased productivity and innovation without increased job stress (Gutek, Bikson, & Mankin, 1984; Rice, 1987). The claims relating CMCS to greater task efficiency and effectiveness are extensive. However, this influence may be limited if the basic communication system is in a state of disarray (Larson, 1984), if adequate training is not implemented to minimize the effects of the learning curve (Rogers, 1986), or if CMCS is used when another mode of communication would be more appropriate (Kiesler et al., 1984).

CMCS has also been connected to the changing nature of roles and status within organizations (Charyk, 1984; Kiesler et al., 1984; Rice, 1982). Researchers have associated the use of CMCS to portions of the workforce becoming obsolete (Rogers, 1986); the evolution of a technological elite, including a high level of status for "information gurus"

(Hiemstra, 1983; Rogers, 1986); the growth of desktop computers serving as a status symbol (Rice & Case, 1983; Rogers, 1986); and an increase in the ability of low tenure members to extend their sphere of influence to higher levels of the hierarchy (Rice, 1982; Steinfield, 1986).

If CMCS significantly alters information processing systems, task efficiency, roles, and status, then one may expect that the nature of interpersonal relationships may also change. Due to the low level of social presence when using CMCS compared with other forms of interaction, users have less ability to communicate status and hierarchy in social relationships (Kiesler et al., 1984; Short, Williams, & Christie, 1976). In comparison to face-to-face communication, CMCS has been reported to be more concise, logical, direct, organized, careful, functional, serious, businesslike, depersonalized, task-oriented, and less emotional, friendly, informal, personal, relaxed, and spontaneous (Furgeson, 1977; Hiemstra, 1982; Johansen & DeGrasse, 1979; Krueger & Champanis, 1980; Spelt, 1977). Researchers have found that users learn to substitute written cues for nonverbal cues that may be essential to developing and maintaining social relationships (Hiltz, Turoff, & Johnson 1985; Love & Rice, 1985; Phillips, 1983; Pollack, 1982; Rafaeli, 1983; Spelt, 1977). Thus CMCS users may be able to use the system to extend their network of interpersonal relationships in the organization (Danowski, 1982b; Spelt, 1977). CMCS has been used not only to accomplish task objectives but also to communicate jokes, to send humorous messages and personal messages, to announce social events, and in one case to exchange complaints about management (Emmet, 1981; Marvin, 1983; Rafaeli, 1983).

The literature suggests that business communication technologies like CMCS may be related to significant and persistent differences in organizations. It is imperative that business communication practitioners and researchers continue to increase their awareness of the breadth, depth, and implications of CMCS usage.

## METHOD

This study explored the impact of the Professional Office Systems (PROFS) on two organizations. PROFS facilitates computer messaging and conferencing, preparing documents, transferring files, and scheduling facilities and appointments electronically. Fifty-eight PROFS users were interviewed and a different set of 62 PROFS users completed two critical incident forms—a total of 120 persons participated. Twenty-nine loosely structured interviews were conducted at the corporate office of a

national financial planning company, and 29 were conducted at a regional office of a computer sales company. All of the critical incidents came from the financial planning company.

The financial planning firm had approximately 5,000 employees and 1,000 PROFS users. PROFS had been in the organization for four years, and an accelerated adoption plan was adding nearly 100 users each month just prior to the time of this study. The regional office of the computer sales firm had approximately 500 employees with an average of one computer for every two individuals. Each individual had access to PROFS, which had been instituted two years prior to the study. Both organizations were "high-tech" firms using sophisticated data bases and open office environments. In both organizations individual work stations were set apart with partitions about six feet high. Only managers had closed offices, which were usually in the corners or along the outside walls of the building. In the financial planning firm, PROFS users were spread among three buildings in a downtown area. Each organization can be described as a conservative, traditional hierarchical structure, with strict dress standards and very strong organizational cultures.

The participants were randomly selected to participate either in a 30- to 45-minute, loosely structured interview or to fill out a critical incident form. The interviewers were accompanied by a recorder who took notes on questions covering all or a portion of the uses of PROFS and how PROFS affected the following categories: (1) access, reception, and distribution of information; (2) tasks and work environments; (3) relationships with bosses, peers, and subordinates; (4) personal communication styles; and (5) overall organizational impacts. Occasionally the interviews covered only two or three of the topics. When individuals raised unanticipated topics and issues, efforts were made to explore the issues in depth.

The critical incident surveys were distributed and returned by hard copy mail to a central location. Critical incidents allowed individuals to stress what they perceived to be high priority issues that related to the positive or negative impact of CMCS. Two critical incident forms were distributed. The first critical incident form requested incidents that illustrated one's satisfaction or dissatisfaction with PROFS and the second requested information that illustrated how PROFS had affected productivity either positively or negatively.

### **Data Analysis**

The interview data were content analyzed while observations and critical incidents added depth and context to the overall analysis. The

interview data consisted of 439 statements produced from 58 interviews. No attempt was made to impose a predetermined system of categories on the data. Instead, grounded theory was used to permit the data to generate categories with the same general properties (Glaser & Strauss, 1967).

A total of 98 separate critical incidents were reported. The incidents generally reflected a single theme and provided perspective and depth to the impact of CMCS. Observations were made throughout the lengthy process of conducting the research and were a result of informal conversations, noting the physical layout of the buildings and office space, and taking note of the informal rules, policies, and cultures within the organizations.

The interview data from the two organizations were initially scanned for differences and commonalities. Since it was obvious that the commonalities significantly outweighed a few differences, the researchers decided to treat the data from the two organizations as a single case. Five categories emerged from the analysis of the interview data including (a) quality and quantity of interpersonal relationships, (b) structure of messages/memos, (c) task efficiency, (d) physical and procedural changes in the work environment, and (e) information processing systems. Interrater reliability of the coded interview statements was .92. The results and discussion of the data follow.

## **RESULTS AND DISCUSSION**

When asked how they used PROFS, individuals indicated that they used the system as follows: 84 percent said that they used PROFS for interorganizational correspondence, 37 percent for electronic calendaring, 22 percent for obtaining technical information, 15 percent for brainstorming and problem solving with others, and 2 percent for document preparation. The data suggest that PROFS is recognized by the workers as an effective means of sending notes and memos. However, in many of the departments in the financial planning firm, managers required all individuals to use the calendaring feature of the system to achieve greater efficiency in coordinating schedules. Word processing for lengthy documents was accomplished either through separate word processing software or by a local word processing center.

### **Impact on Interpersonal Relationships**

Of the total 474 statements in the data, 126 made reference to the impact of PROFS on the quantity and quality of interpersonal relation-

ships. Of these 126 statements, 37 (29 percent) referred to the impact of PROFS on the number of relationships one might engage in and 89 (71 percent) dealt with the quality of interpersonal relationships. Also, 61 statements (49 percent) were categorized as positive effects, 34 (26 percent) were categorized as negative, and 31 statements (25 percent) were categorized as neutral (see Table 1).

Table 1  
Impact of CMCS on Quality of Interpersonal Communication

Statement Polarity	Quality of Relationships	Quantity of Relationships
Positive	45	16
Neutral	24	7
Negative	21	13
<b>Total</b>	<b>90</b>	<b>36</b>

The positive statements indicated that PROFS made it easier to interact and keep in touch with more individuals. For example, PROFS made it possible to overcome the "obstacle of telephone tag" and to communicate with others who were not otherwise accessible because of geographical distance. Individuals suggested that "communication has improved by being able to write down my ideas", "that "technology means that our supervisors now have more respect for us—we gain a mutual respect and knowledge," and finally that "technology has allowed more feedback to occur." The data provided a clear indication that a majority of individuals related CMCS to improved interpersonal relationships within their organization.

As Table 1 also indicates, a significant amount of the data was categorized as neutral (indicating that the statement took neither a positive nor negative orientation). For example, individuals discussed PROFS being used by themselves and others for social purposes such as coordinating bowling and golfing activities. One individual observed that "there is a \*\*\*\* of a lot of stuff about how bowling and golf are going" over PROFS. When discussing the social aspects of PROFS, the researchers noted that individuals were careful to justify and couch their responses with "everyone does it." However, when asked, one high-level manager commented that "it would not be appropriate for people to be sending love letters back and forth." Another manager commented that he occasionally checked subordinates' PROFS messages to determine that the system was not being used "inappropriately." What exactly constituted appropriate or inappropriate uses of PROFS was not formalized in policy, and considerable equivocality existed regarding the issue.

Two important points should be made about the use of PROFS for social purposes. First, attempts were made to verify whether it was technically feasible for individuals to access a coworker's PROFS account. Management and a vast majority of the individuals interviewed were adamant that a password was required to access any account and that account owners were the only ones who knew the password (the only known exception to this were a few technicians with high-level access). Individual PROFS users also had the ability to change their password at any time. However, as has been previously discussed, strong evidence indicated that in some cases managers had accessed the PROFS accounts of their subordinates. According to the organization, the only way that a manager could access a subordinate's account was by controlling the subordinate's password. Evidence suggests that some managers may have kept a list of passwords and thus were able to access the accounts of subordinates. Policies relating to the privacy of PROFS accounts is an issue that should be addressed by business communication practitioners and researchers.

Second, in the absence of a formal policy on appropriate and inappropriate uses of PROFS, an informal policy had apparently evolved in one of the organizations. One event in particular may have contributed significantly to the development of an informal policy. The event was reported on a critical incident form and also repeated in story form in a number of interviews. An employee with the necessary computer access designed PROFS so that the last work day before Easter an Easter bunny appeared on each person's screen as he or she logged on. In response to the Easter greeting, a senior vice president seriously reprimanded the employee, who was reportedly almost fired. The vice president may have felt that the time spent with this type of activity represented an inappropriate use of PROFS. Because this story was well known and repeated often, the researchers concluded that it communicated the existence of an informal policy throughout the organization. However, a number of questions remain. Is a perception of inappropriate use influenced by with whom the interaction occurs (using PROFS to socialize with those higher up in the hierarchy versus coworkers)? Is it related to who is aware of the interaction (one may be able to socialize with one person higher up in the hierarchy but not with many persons simultaneously higher up in the hierarchy)? Is it related to what type of interaction is occurring (organizing a company social might be acceptable but comparing notes on golfing and bowling may be borderline)? In both of the organizations there was considerable ambiguity regarding what constituted appropriate or inappropriate uses of PROFS.

Some statements in the data were particularly difficult to categorize, and yet they provided important insights into the impact of PROFS. For example, one individual talked about liking PROFS because it made it possible to communicate less on a face-to-face basis with a particular co-worker whom the individual actively disliked. Another individual appreciated PROFS assistance in communicating since this individual did not feel comfortable communicating verbally. Both of these individuals thought of PROFS as having a positive impact on their relationship with others, but for reasons that others might consider inappropriate. Should not professionals be expected to communicate face-to-face with someone they dislike? Should not those who consider themselves to be weak in verbal skills be actively improving rather than using PROFS to escape the necessity of verbal interaction with others? Inappropriate uses of CMCS may result in decreasing morale, which is illustrated in the following critical incident where a manager was criticized for engaging in management by computer. A subordinate related the following:

My director, who lacked personal communication skills, took such a liking to PROFS, that he would sit in his office all day and never come out. He preferred to send electronic notes to everyone rather than stick his head out the door. We all had desks near his office. It got to be a joke to see who got the most (or least) notes from him in a day. He was a classic case of a man retreating from personal contact and turning instead to the computer.

The subordinate acknowledged that the manager had a great deal of technical expertise but felt that the overall impact of PROFS had been negative in terms of superior/subordinate relationships and departmental morale.

Another telling incident occurred as one of the researchers was conducting interviews on a Friday afternoon. Earlier in the day many of the employees in a particular department where the researcher was interviewing had attended a retirement party for a coworker (a mid-level manager with 23 years of service). Late in the morning the individual who was retiring received a congratulatory note over PROFS from someone higher up in the hierarchy whose office was very close to his own office. The retiree was insulted and, although not scheduled for an interview, demanded an opportunity to say what he thought about PROFS. The employee felt that 23 years of service deserved at least a personal visit from someone only a few doors down the hall instead of a PROFS note. Perhaps this type of concern was what another person meant by a critical incident statement that "when people work together as a team, it (PROFS) makes the interpersonal relationships, trust, and

evaluations very shallow. . . . I also have seen items communicated that should be dealt with in private or face-to-face that were completely misunderstood and mishandled because of a lack of personal contact."

Conflicting opinions and perceptions of the impact of PROFS on interpersonal relationships were prevalent throughout the data. It is significant that poignant concerns about the impact of PROFS on interpersonal relationships were expressed in 24 percent of the interview data. On the other hand, the critical incident data appeared to be related more frequently and explicitly to perceived negative effects. One reason for this may be that there was greater anonymity possible through the critical incidents than through the interviewing process (though interviewees were assured that their responses would not be associated with them individually).

New technologies such as PROFS do not exist in isolation, rather they interface with the dynamics of organizations and have the potential for influencing interpersonal relationships positively or negatively. If the existing climate in a department is threatening, then individuals may choose to use PROFS to stay at their work stations and thereby avoid face-to-face or even telephone interaction with others. On the other hand, in departments where the climate is warm and supportive, individuals may use PROFS to extend and maintain a network of egalitarian interpersonal relationships. Thus, in large organizations one should expect conflicting data since there are pockets throughout the organization with positive and negative climates.

Individuals who lack interpersonal skills may not be able to distinguish between appropriate and inappropriate uses of PROFS. The effects of inappropriate uses of PROFS by the interpersonally insensitive may be intensified when such individuals are at a high level in the organizational hierarchy. On the other hand, when PROFS is used by skilled interpersonal communicators, negative effects may be diminished and, in fact, relational processes may be improved. Business communication practitioners and researchers need to further explore the interface between PROFS and organizational variables such as interpersonal skills, climate, culture, and management philosophy.

### **Message Structure**

Of the 474 interview statements, 25 were categorized as focusing on the structure of messages (no critical incidents were received relating to this category). These data noted the degree to which messages were either longer, shorter, or more or less verbose. A majority (18 of the 25, or 72 percent) of the statements reported that PROFS "cuts out small

talk on extraneous things," "makes it [communicating] short and crisp," and "allows the sending of quick memos." PROFS appears to contribute to a higher number of shorter messages. Reduced reliance on telephone interaction and increased reliance on PROFS may explain these findings since telephone communication may encourage "small talk" and discourage "quick" and "crisp" interaction.

Seven of the statements in this category (28 percent) made reference to PROFS notes being "more wordy" than traditional hard copy memos. One explanation of this may be that in both organizations there were few "traditional" secretaries to "clean up" outgoing memos. From the top to the bottom of the hierarchy, all PROFS users were expected to process both their incoming and outgoing internal PROFS mail. In one of the organizations, management had formally announced that internal PROFS notes need not be grammatically correct. Through the process of observation (on several occasions the researchers sat with PROFS users as they processed their incoming and outgoing notes), the researchers received no indications that users resented having to type a message or had significant anxiety about the grammar, spelling, or wordiness of notes they sent.

### **Task Efficiency**

Two hundred and five of the 474 interview statements were categorized as task related. Of these 205 statements, 163 (79 percent) were categorized as positive, 22 (11 percent) were categorized as negative, and 20 (10 percent) were categorized as neutral statements regarding the impact of CMCS on task efficiency. In regard to tasks, PROFS appeared to have had the greatest impact on clerical workers. For example, one secretary related the following experience in an interview.

After the introduction of PROFS, management identified her position and the position of many of the secretaries as no longer necessary. Both the secretary and the boss planned to retire within a few years, and neither had learned to use PROFS. The secretary's boss resisted eliminating the secretary's position, but upper-management insisted and the position was eventually eliminated. The secretary, however, was transferred by her boss to a different position—one with a technical title and a job that she knew virtually nothing about. Though her title and "formal" job responsibilities had changed, she continued to do secretarial work for her boss.

Change can be disruptive, but some organizational members develop "creative" strategies that minimize disruptive influences and simul-

taneously maintain the appearance of being in step with advancing business communication technologies.

Another strategy used in reducing secretarial positions was to train a few select secretaries as Local Technical Support (LTS). When PROFS was initially introduced, these select secretaries received extensive training on the system and became responsible for providing technical support for new PROFS users within a specified location in the organization. LTS people, who were former secretaries, expressed bewilderment that managers were "doing all their own typing" and that persons with only a high school diploma were advising corporate executives on the functions of technical systems. In the case of secretaries, a select few were able to upgrade their tasks and thus improve their status while others experienced the opposite—their positions were eliminated from the organization.

A majority of organizational members were not as dramatically affected; they generally associated PROFS with being able to "bang out more stuff," "accomplish more," or "produce more." One person noted: "Technology has affected my personal advancement through knowing how to use the technology." Even though employees indicated that their workload had increased, they added that "it doesn't seem like it" and without PROFS the "workload now could not have been done ten years ago." Also, greater stress as a result of increased task demands may not be a problem since, as one person noted, "it is impossible to measure productivity with the kind of work that we do." Improvements in business communication technologies in general may result in increased task expectations and workloads, but PROFS was perceived as a required tool that many individuals felt they "could not live without."

Not only did individuals consistently confirm PROFS as adding to their personal productivity but they also frequently mentioned specific activities where PROFS had resulted in greater efficiency. Improvements in efficiency covered a wide range of activities including the following: More productive meetings because "people come better informed with more documentation," individuals can no longer "say that they did not get it [important memos]" since PROFS provides a means of confirming that a receiver has opened a note, a decrease in the number of meetings held since problems could be coordinated and solved on a more timely basis, an increased ability to efficiently distribute and obtain critical information, and a decrease in telephone tag.

Some individuals also expressed concern about the impact of PROFS. For example, some individuals experienced frustration at being expected to rapidly learn new systems without adequate training. Individuals

communicated that "[they] get \*\*\*\* fed up with having to learn a new system," "training classes talked way over my head," and there was anxiety in having to learn PROFS quickly when "I knew I couldn't." Some individuals felt that PROFS was one more new technology to learn and was "causing me stress, making my job more stressful."

A number of critical incidents forms reported circumstances where PROFS had been perceived as less efficient in accomplishing organizational tasks. One individual noted on a critical incident form that computer communication occasionally slowed down response time. This individual explained the following: "When I sent a note to a person, they responded slower than if I had contacted that person by phone. I could have called and received an immediate response. They said the delay was caused by not receiving a 'Mail waiting' message or a 'beep'". Another individual reported that "because the capability to communicate via the keyboard is so readily available, very often we are asked to prepare a written message as opposed to a verbal communique. Written communication takes significantly longer than verbal communication; therefore, communication may not be as speedy or timely."

Both of these critical incidents focus on the observation that PROFS is probably not the most efficient method for accomplishing all organizational tasks. Indeed PROFS may best be conceptualized as another business communication tool to be used for appropriate occasions. The criteria for the appropriate application of PROFS may be a useful area of research in the future.

Overall, the data provide evidence that a majority of individuals in both organizations had been able to effectively adopt PROFS and associated it with significant improvements in task effectiveness and efficiency. However, the tolerance threshold for technological change may be exceeded for some organizational members when new technologies are being rapidly introduced. The adoption of new business communication technology is required if organizations are to maintain a competitive position in increasingly complex and dynamic environments. Thus, those individuals who can adapt quickly are likely to be rewarded by organizations. Those who introduce new communication technologies to organizations should recognize that too rapid an introduction of new technologies can reduce effectiveness and evoke resistance from the workforce.

### **Work Environment**

Fifty-three of the 474 interview statements focused on the work environment: 13 statements (24 percent) referred to the physical en-

vironment, and 40 statements (76 percent) mentioned procedural changes. The physical environment category referred to lighting, desks, temperature, chairs, walls, and new equipment; the procedural environment category made reference to processes of accomplishing tasks.

The general feeling among the individuals interviewed was that the physical environment was unaffected by PROFS. Only one person expressed a negative change and that individual claimed that "PC's make it hot in here." This individual had two fans to help deal with the heat. Another person claimed that PROFS had "greatly improved the desks, the chairs, and the lighting." Other than these two cases, there was neither a positive nor a negative perception of changes in the physical environment due to increased computerization. When asked, a vast majority of the individuals simply stated that increased use of computer communication systems had not affected the physical environment (both organizations had devoted considerable resources to making certain that individual comfort was maximized at work stations). Perhaps physical comfort is an expected condition in the workplace. Though a lack of comfort may produce negative perceptions, adequate comfort is not associated with positive improvements in the physical environment.

The interviews included considerable discussion relating to the impact of PROFS on how organizational work was accomplished. Of the 40 statements in the procedural category, 20 were positive, 16 were negative, and 3 were neutral. Positive statements about the impact of PROFS on procedures noted improvements or replacements of "less efficient" methods with easier, faster, and more efficient work processes. For example, PROFS was identified as providing greater access to data bases so that the "computer is routinely used to check for information; whereas, before a manual check of the books was required." Many individuals also noted the efficiency of electronic calendaring in setting up meetings and coordinating facilities and schedules. One individual reported the following on a critical incident form: "I arranged a meeting of six people in a matter of minutes—all of them came. This was simple compared to the old method of hit or miss phone calls."

Concern about electronic calendaring was also encountered. Some organizational members expressed resentment that others had access to their calendars. One critical incident may have provided a partial explanation for these feelings of resentment. The critical incident reported that PROFS electronic calendaring function was being used increasingly by managers to call "spur of the moment meetings." This individual had received meeting announcements over PROFS just 15 minutes prior to the actual meeting time. Other individuals had missed

important meetings entirely because they either happened to be away from their work station at the time the PROFS note came in or they did not respond immediately to a beep from the computer announcing an incoming message.

Other subtle but important reasons exist that individuals may resent electronic calendaring. For example, when one does not want to accept an invitation for lunch, one can respond with an equivocal statement about being previously committed—even if it is a commitment to oneself. With the advent of PROFS calendaring, everyone can have access to the calendar of others, thus the strategic use of ambiguity about one's existing commitments may not exist. Second, authoritarian managers may have a tendency to use electronic calendaring to “keep track” of exactly where “their” people are, what they are doing, and when they are doing it. At least one concern associated with electronic calendaring appears to be the increased immediacy of control that others have over one's organizational life. Increased awareness of the interface between a supervisor's management philosophy and the application and impact of a new business communication technology, like electronic calendaring, may be useful in ensuring that new business communication technologies do not inadvertently contribute to the dehumanization of the work place.

### **Information Processing Systems**

Thirty-six of the 474 interview statements were categorized as focusing primarily on organizational information processing.

Specifically, 28 of the 36 statements (78 percent) indicated that PROFS had significantly improved the organization's information processing system, 5 statements (14 percent) reflected some concerns, and 3 statements (8 percent) reflected the opinion that PROFS had not resulted in any significant changes.

The data suggest that employees are able to receive, distribute, and access more information and deal with the information efficiently; thereby avoiding information overload. None of the data collected (interviews, critical incidents, or observations) indicated that individuals had experienced information overload in association with their use of PROFS. (On a number of occasions, the researchers observed individuals process incoming and outgoing information and noted the efficiency with which they used pre-programmed mailing lists to pass information to individuals and groups, and to store, retrieve, or delete information—each of which was a matter of a few key strokes.) Traditional processes of dictating, typing, copying, addressing, mailing, etc., had been nearly

eliminated. This new information processing system was consistently described as providing "the opportunity to keep up with what is happening in the rest of the world (the organization as a whole)," to "feel more informed," to "know what we need to know as well as what is nice to know," and to "have everything right at our fingertips."

Even though these feelings were popular, a small minority of individuals expressed concern that they did not "like the idea of people being able to send [their] material forward without [their] permission" and because of PROFS "people have access to too much private information." Overall, however, organizational members clearly perceived PROFS as providing improved information processing and a feeling of being better informed.

Another information processing issue concerned reservations about sending or receiving confidential memos electronically. Most respondents expressed no reservations about sending or receiving confidential information since one's password was confidential. As noted above, a few exceptions existed, specifically those who believed that their managers could access their PROFS mail. In one critical incident, an individual reported that confidential information inappropriately became known when it was seen printing out at a public printer (most PROFS users did not have printers at their work stations).

Finally, PROFS may affect the degree to which organizations can be described as an open information processing system. Organizational members expressed perceptions of greater openness in that they could "send a message directly to a vice president," "deal more directly with the superiors," and "before PROFS I never used to write notes to my manager." A legitimate question may be, "Why do organizational members think of PROFS as providing greater access to those at higher levels of organizations?" or "Why hasn't the telephone been perceived as providing the same access?" A number of explanations for this phenomenon exist. First, it may be that the unobtrusive nature of CMCS (receivers can attend to incoming PROFS notes at their own convenience, which is not possible in face-to-face communication) may liberate some to a freer exchange of information with those at higher levels of the hierarchy. The unobtrusive aspects of CMCS may encourage interaction because of lower perceived risks. Second, the ambiguity of policies regarding how PROFS can be used, and with whom one can communicate, may provide for experimentation by organizational members. Whatever the case, organizational members clearly relate the use of PROFS to basic changes in relational dynamics.

## CONCLUSION

The purpose of this paper has been to use qualitative methods in an attempt to grasp the "depth," "thickness," and "richness" of individual interpretations of the complex and often subtle relationships between CMCS and human experience. Consistent with the nature of qualitative research, this project has not attempted to reach definitive and generalized conclusions, but rather has been directed toward insights and possibilities from the perspective of individual users of CMCS within two organizations.

The analysis and discussion of the data revealed several important perceptions of organizational members. First, CMCS was perceived by organizational members as influencing basic organizational processes. For example, the participants associated PROFS with changes in the nature of their interpersonal relationships, information processing systems, roles and status, productivity and efficiency, and alterations in the nature of their work. Each of these perceived effects has been discussed in the preceding section and several recommendations have been made for future research.

Second, considerable variance existed in how the participants interpreted the impact of CMCS in their organizational lives. To understand these variations in interpretation, it may be helpful to think of CMCS as a tool with a variety of uses and thus a variety of impacts. The uses and impacts of CMCS appeared to be affected by a variety of organizational variables, such as: the level of interpersonal sensitivity among CMCS users, the organizational culture and climate, and the predominant management philosophy among a given group of users. For example, the impact of CMCS was likely to be perceived very differently within a warm and trusting climate than in a threatening and negative climate.

If participants in this study agree on one thing, it may be the perception of higher levels of efficiency in processing information and accomplishing tasks. In this age of rapid and dramatic change, PROFS appeared to provide individuals with greater flexibility, flexibility in how they accomplished their tasks and flexibility in how they customized personal information systems to fit their unique sets of needs. Paradoxically, increased levels of flexibility for individuals may be a prerequisite to organizational adaptability. Given the reality of rapidly changing external environments, a more adaptable organization should have greater control over its performance in the information age.

While the drive toward greater efficiency is commendable and acknowledged by the participants in this study, organizational members also poignantly expressed concerns. For some, CMCS has resulted in

poorer communication with supervisors, more supervisory control, anxiety about having to learn new technical communication systems, and even loss of employment. The extent to which these or similar problems will be experienced in the future remains uncertain. As the information age continues to evolve, periods of significant disruption and anxiety among the workforce will probably occur. In an attempt to minimize disruptive influences, business communication professionals need be sensitive to the concerns expressed by individuals in this study. The process of actively keeping in touch with the workforce and their interpretations of new communication and information technologies, may be useful in assuring both a high quality of work life and the efficiency required to be competitive in the information age.

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