

United States General Accounting Office

GAO

Office of Information Management
and Communications

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MISSION SUPPORT
PROJECT:
User Perceptions on
Computer
Environments



**Office of Information Management
and Communications**

March 31, 1993

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This report responds to our reporting objectives stated in the Mission Support Project's (MSP) Test and Evaluation Plan and is the third in a series of user benefit evaluation reports.¹ It provides information and user perceptions obtained from a recent survey of the computer environments used by GAO staff. Specifically, it summarizes the benefits and the attributes of operating in direct-access network—a setting where computers are directly cabled to file servers to create a network—and stand-alone computer environments. We have briefed GAO management and the participating units on the survey results, and this report formally documents the information.

Results in Brief

Overall, staff said that a direct-access network allowed them to use their time more efficiently and

¹Our reporting objectives and schedule are stated in the "Test and Evaluation Plan for GAO's LAN Project," issued April 8, 1991. The first report, "Report on Focus Group Interviews Concerning the Novell LAN System," was issued October 25, 1991; the second report, "Mission Support Project: User Perceptions on Computer Use and Network Operations," was issued July 22, 1992.

provided increased and enhanced access to information compared with a stand-alone environment. Almost 70 percent said it took less time to send and receive files using the network. About 90 percent said that a direct-access setting had a positive impact on their personal productivity; over 80 percent said the same for morale. For example, they saved time by using the network to send, receive, review, comment on, and revise products. They also said that it had eliminated "telephone tag" because they could simply and immediately convey messages to one or several people and not spend time trying to contact each one. In addition, morale improved by connecting people even though they were located at various places.

Staff also said that the network kept them better informed and more aware of relevant issues. They said that it had provided a much more efficient distribution of information and encouraged and enhanced coordination. Another key benefit was access to more software applications and printers, which allowed staff to produce higher quality products in less time. Staff were able to learn and incorporate new applications and had immediate access to the most current versions of others that they were already familiar with. Other said that the access to more and better software improved their analyses, and the laser printers allowed them to print better quality products and print them faster. In summary, nearly all—93 percent—responded that they were satisfied with the direct-access environment.

Even though the overall response was positive, staff using a direct-access network had some concerns. A few noted the frustration of trying to work when it was "down", or temporarily inaccessible because of a power loss, unscheduled maintenance, or other operational problems. While they said this did not

happen often, it made routine activities, such as accessing printers and software, cumbersome and time-intensive. In addition, staff in a direct access setting said they would be more satisfied if all GAO units operated in this environment because they could accomplish many routine tasks quickly and easily.² For example, they could simply transfer files electronically to disperse and share information among the direct-access units. However, they needed to print or photocopy documents and then mail, hand deliver, or fax the information to staff who were in a stand-alone setting.

Staff who could access the network using modems and communications software had numerous complaints about this access option. They frequently cited the frustration of trying to “dial-up” and connect with the network. Almost half—45 percent—were dissatisfied with this means of operation, which they described as slow, unreliable, too difficult and time-consuming. They would like to use the network features and options, but said it needs to be through direct-access to be beneficial and efficient.

We asked staff for opinions on whether a GAO-wide network would affect their work quality. They overwhelmingly supported a direct-access GAO-wide network because it would increase work quality by:

- Improving communications between divisions to keep them better informed about ongoing work and relevant issues.
- Increasing access to information so they could conduct more complete analyses and make better decisions.

²Only the Human Resources Division (HRD); the Agriculture, Transportation, and headquarters sites of the Resources, Community, and Economic Development Division (RCED); and San Francisco Regional Office (SFRD) currently operate in a direct-access LAN environment.

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- Allowing them to be more productive with time now spent copying, faxing, mailing, and delivering information or playing telephone tag.

Project Background

The MSP focuses on establishing the network capability that will enhance communication and improve information access to support GAO's mission of providing accurate information, unbiased analyses and objective recommendations. The MSP also seeks to optimize the use of information technology to complement and support current and future quality management initiatives. A key objective is to forge a partnership between systems developers and users to ensure that the technology—software applications and a network environment—meets user requirements.

A project team of evaluators from divisions and regional offices, technical specialists from the Office of Information Management and Communications, consultants, and contractor staff is carrying out the MSP objectives. They have identified the user needs for technology and information access and are developing a Data Collection and Analysis (DCA) application to meet these needs. Staff from the MSP pilot sites—HRD, RCED, and SPRO—will test the application in a network environment to determine whether user needs are being met and to evaluate user benefits.

The questionnaire, distributed on a semi-annual basis, is one component of an overall evaluation strategy the project team is using to identify and measure benefits of technology. The survey provide qualitative information by obtaining pilot participants' perceptions on computer use in direct-access and stand-alone environments. The team is also recording the time and steps needed to complete assignment tasks in these two settings to obtain quantitative

measures. The team will use the perceptions and measurements to assess benefits of using technology to carry out GAO's work.

Scope and Methodology

The MSP team sent a questionnaire to 900 HRD, RCED, and SFRO staff at the end of September 1992 to obtain information on the computer environments they used in fiscal year 1992. About 700 staff completed the survey for a response rate of 77 percent.

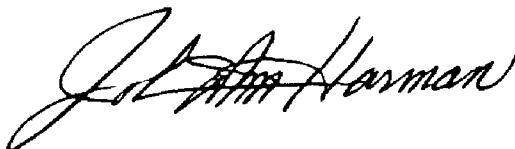
The questionnaire asked staff to

- indicate the computer environments they used—direct-access network and stand-alone;
- state how frequently they performed certain tasks, such as accessing software and printers;
- indicate how satisfied or dissatisfied they were with the different environments and provide reasons for their level of satisfaction;
- rate the ease or difficulty they experienced in completing tasks;
- compare the time spent in a direct-access with time spent in a stand-alone setting and indicate how the direct-access network affected their work quality;
- provide opinions on whether a GAO-wide network would increase their work quality; and
- indicate their need for software and/or network training.

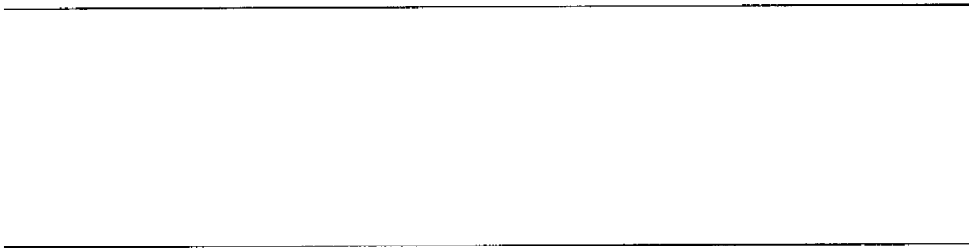
Respondents provided over 1,000 written comments on benefits of using technology for our work, and also cited some concerns and training needs. Staff comments on benefits related to time savings, increased productivity, improved and enhanced communications and information sharing, and increased access to software and hardware. They also noted some problems, such as the difficulty in using modems to access the network, a lack of printers, and the need for training.

We appreciate the time and the effort of pilot participants in completing the questionnaire. Their responses provide information that helps the MSP team evaluate user benefits and design a system that will meet user requirements.

Please contact me at (202) 512-5138 if you or your staff have any questions. Major contributors to this report are listed in appendix II.

A handwritten signature in black ink, reading "John W. Harman". The signature is written in a cursive style with a large initial "J" and "H".

John W. Harman
Project Director, Mission Support Project



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Abbreviations

HRD	Human Resources Division
MSP	Mission Support Project
RCED	Resources, Community, and Economic Development Division
SFRO	San Francisco Regional Office

Questionnaire Results

In September 1992, we sent questionnaires to 900 pilot participants in the Human Resources Division (HRD); the Resources, Community, and Economic Development Division (RCED); and the San Francisco Regional Office (SFRO).

The questionnaire addressed how technology had affected their work and asked staff to describe their use of computer, software, printer, and network technology during fiscal year 1992. Specifically, the survey focused on (1) computer environments used—direct-access or stand-alone; (2) level of satisfaction with the different environments; (3) types and frequency of tasks performed; (4) time spent performing tasks; (5) impact of direct-access on their work quality; (6) ease or difficulty of accessing software and printers; (7) possible effect of a GAO-wide network on GAO's work; and (8) training needs. The survey also asked staff for examples of how technology had affected their work and why they were satisfied or dissatisfied with the technology they used.

About 700 staff answered the questionnaire for a response rate of 77 percent. They also provided over 1,000 comments, which focused primarily on how a direct-access network saved time, improved productivity, increased and enhanced communications and sharing of information, increased access to software and hardware, and provided cost savings. They also described problems in accessing the network using modems and communications software, identified training needs, and provided information on other issues.

The following sections summarize the survey results; appendix I contains the questionnaire and a tabulation of responses.

Use of Different
Computer
Environments

During fiscal year 1992, the pilot staff used computers in two types of environments:

- Direct-access: The staff used computers that are directly cabled—"hard-wired"—to file servers to create a network environment. Staff had direct on-line access to network features—numerous software applications, different printers, data files, messages, and bulletin boards.
- Stand-alone: Computers operated as individual units, and staff generally use software located on the computers' floppy or hard disks. To print out files and information, they used printers connected to their computers or, if their computers did not have printers, they had to take their floppy disks to computers that did. The only way that staff could access the network was to use computers that had modems and communications software required to connect with the network.

During the last 6 months of this fiscal year, the number of staff using computers in a direct-access network setting had increased significantly compared with the first half of the fiscal year. Only 298 staff were in a direct-access setting during the first half; this increased to 448 by the end of the fiscal year. This happened because file servers were installed during March and April 1992 to provide the pilot units with the network equipment necessary to complete the pilot test for the Mission Support Project (MSP).³ Figures 1 and 2 show the percentage and the number of staff who operated in direct-access settings compared with stand-alone settings during the first and last 6 months of fiscal year 1992.

³File servers were installed at the RCED Agriculture and Transportation audit site and HRD locations.

Figure 1: Staff Using Computers in Direct-Access Network and Stand-Alone Settings—First Six Months of Fiscal Year 1992

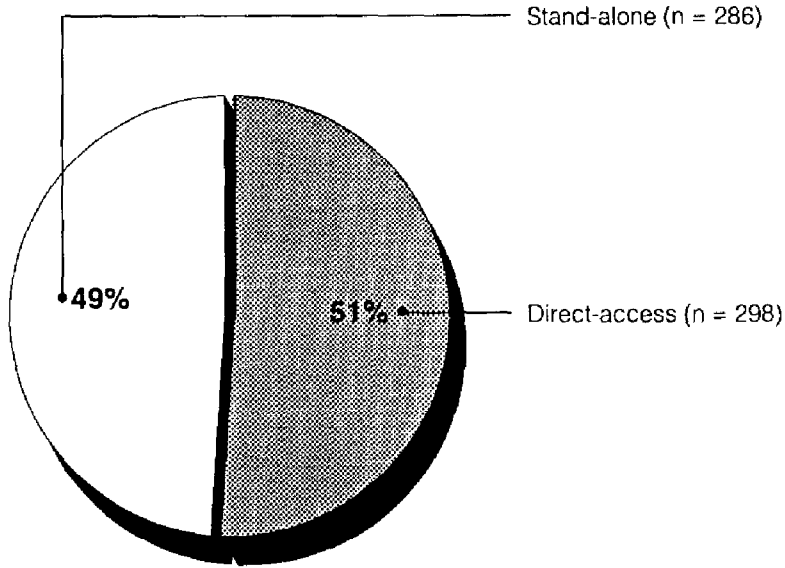
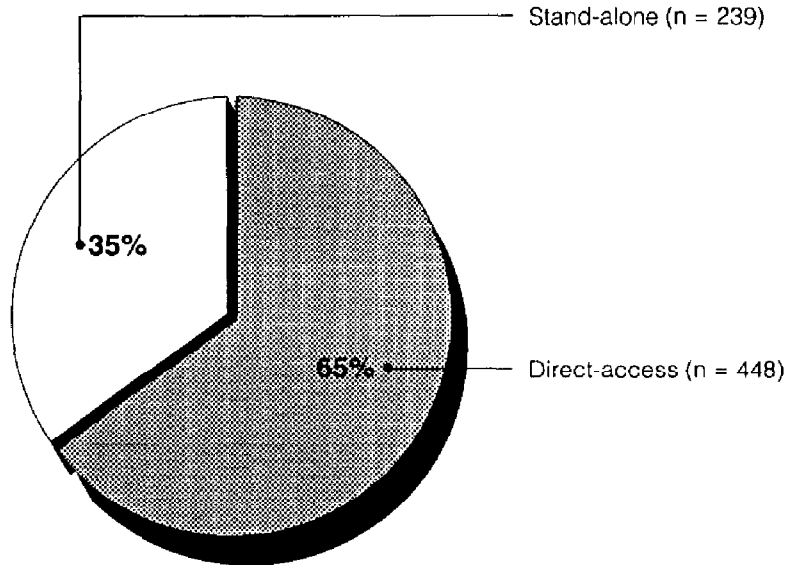


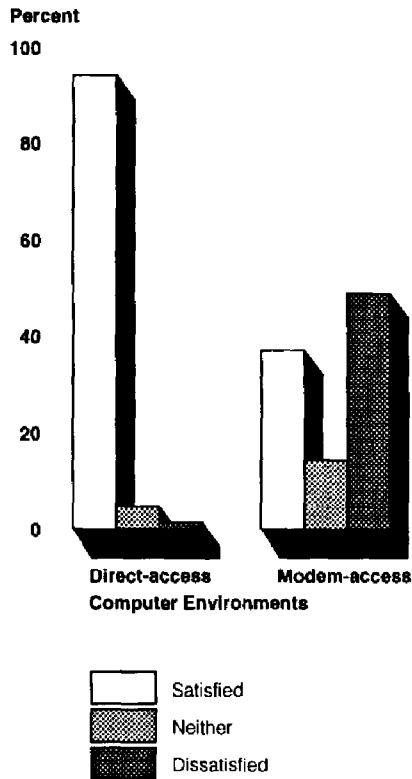
Figure 2: Staff Using Computers in Direct-Access Network and Stand-Alone Settings—Last Six Months of Fiscal Year 1992



Satisfaction With Computer Environments

We asked staff how satisfied or dissatisfied they were with the direct-access and modem-access environments as an effective way to coordinate with people; send and receive messages and files; and access software, printers, and information (such as data files and bulletin boards). Staff with a direct access network were overwhelmingly satisfied—93 percent—with their work setting. However, for staff who could access the network only by way of modems, just 39 percent were satisfied and almost half—45 percent—were dissatisfied with this arrangement. Specifics for each setting are shown in figure 3:

Figure 3: Staff Satisfaction With Computer Environments



Staff were satisfied with direct access for numerous reasons, but most often because it improved communications, enhanced access to information, and saved time. They cited the importance and benefits of sharing information and the ease with which they could do this. Others noted the time savings that direct access provided to circulate, review, comment on, and revise products. For

example, one person said that he was able to receive, review, and provide comments on testimony in half a day, a much faster turnaround than possible in a stand-alone setting. Staff also said that they had saved time communicating and coordinating with others because they could send messages and convey information instantaneously. This was far more efficient than playing "telephone tag" or waiting for the appropriate time to call staff in different time zones. Comments reflecting these perceptions follow.

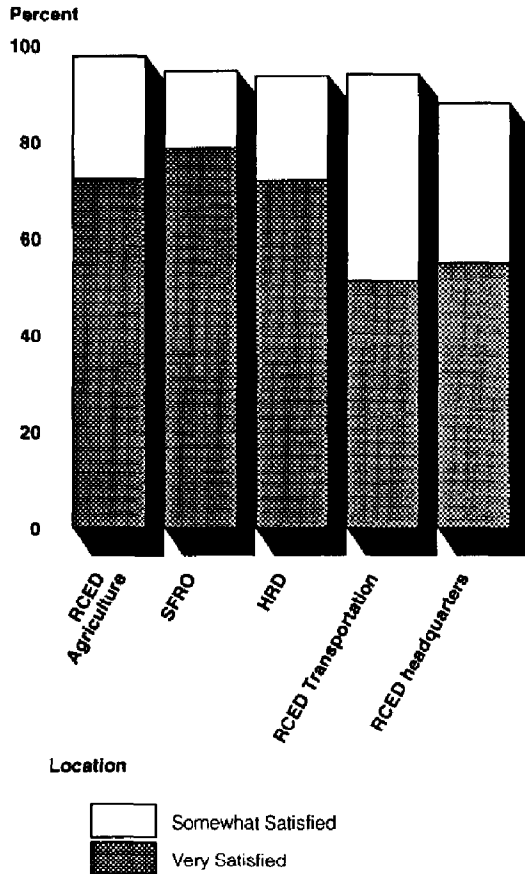
- "Without a direct-access network, a tremendous amount of time can be lost trying to contact people. However, with the network, you can post a message and forget it. Also, the ready access to software is great. I also enjoy the high-speed, high quality of the laser printer."
- "The network greatly facilitated making changes to draft product—I could retrieve file from shared drive, make changes and then save it to the shared drive at the end of the day, where it could be retrieved by my supervisor at the beginning of the next day. This was very beneficial because we worked different schedules and he could retrieve the draft first thing in the morning, long before I showed up for work."
- "Since we are hooked up to the printers with the network, we do not need to walk around and look for an available printer. Also, time is saved transmitting data files with electronic mail messages and less time is used for printing and making copies of documents."

As described above, staff generally were dissatisfied with modem-access, frustrated primarily with the time and the effort they had to expend to access the network. A sample of the numerous complaints follows.

- “Modem-access is a giant pain in the neck. I only had one telephone line which diminished rather than enhanced by ability to communicate. Logging on was always an iffy proposition and the after-15-minute-lock-up feature was awful.”
- “Modem-access is clearly undesirable compared to direct-access.”
- “It is often difficult to get access—always need to try more than once and sometimes need to try 5 or 6 times (Sometimes, I don't get access at all.)”
- “Main source of dissatisfaction with modem-access is inability to log onto the system. Over 50 percent of the time, there is ‘no answer’.”
- “Modem-access is incredibly slow—I do not believe it's worth the time I have to put in to use it.”
- “Frequently, after dialing several different call-in numbers, it still doesn't connect. It impedes productivity.”

While almost all the pilot unit staff were satisfied with direct access, the degree of satisfaction varied by location. As shown in figure 4, RCED's Agriculture audit site, as well as the SFRO and HRD locations have a higher percentage of staff who are very satisfied with direct access compared with RCED's Transportation and headquarters locations.

Figure 4: Staff Satisfaction With Direct-Access Network by Location



Reasons for lesser satisfaction focused on work interruptions because of network downtime or a need for more support so that staff can more fully use network options. For example, staff commented as follows:

- “As long as the network doesn’t go down, I use it all the time. However, if I’m working on a file that is very important, I’m afraid to use the network since it has previously shut down in the middle of revising a draft report.”
- “Direct-access is great until it crashes and you have to stop work. While this does not happen often (perhaps once every 2 months), it shouldn’t happen.”
- “My primary concern is the difficulties I and others have in using the network to send print jobs to the printers—rarely works properly.”

Access to Software and Printers

Overall, staff were very pleased with the access to software and printers provided by a direct-access network. About 94 percent and 83 percent, respectively, said it was easy to access software and printers in this setting. Staff in stand-alone settings where they used software from their floppy or hard disks and printers connected to their computers (no access to network) also said it was easy to access these tools, but they were less satisfied than staff with direct-access. Furthermore, staff who tried to access software and printers via modems were even less satisfied. For example, only 48 percent said it was easy to access software, while 39 percent said it was difficult. Tables 1 and 2 provide details on the ease or the difficulty that staff experienced when accessing and using software and printers in direct-access and stand-alone environments.

Table 1: Ease of Software Access

Computer Environment	Number of Staff	Easy (percent)	Neither (percent)	Difficult (percent)
Direct-access network	488	93.9	4.3	1.8
Stand-alone:				
No access to network	355	89.0	5.4	5.6
Modem access to network	243	48.1	12.8	39.1

Table 2: Ease of Printer Access

Computer Environment	Number of Staff	Easy (percent)	Neither (percent)	Difficult (percent)
Direct-Access network	474	83.3	7.0	9.7
Stand-alone:				
No access to network	330	76.1	7.3	16.7
Modem access to network	196	55.6	10.2	34.2

Staff with a direct-access network frequently cited the improved and increased access to software and printers. They said that with direct access, they saved time because they could simply choose software and printers using the computers on their desks, versus walking around to locate them. For example, staff described the ease of entering print commands from their computers and then retrieving the printed products from the selected printer locations when convenient. This was far easier than transferring the files to floppy disks, going to other computers that had the necessary printers attached, often waiting for those computer and printer workstations to become available, and then printing the files.

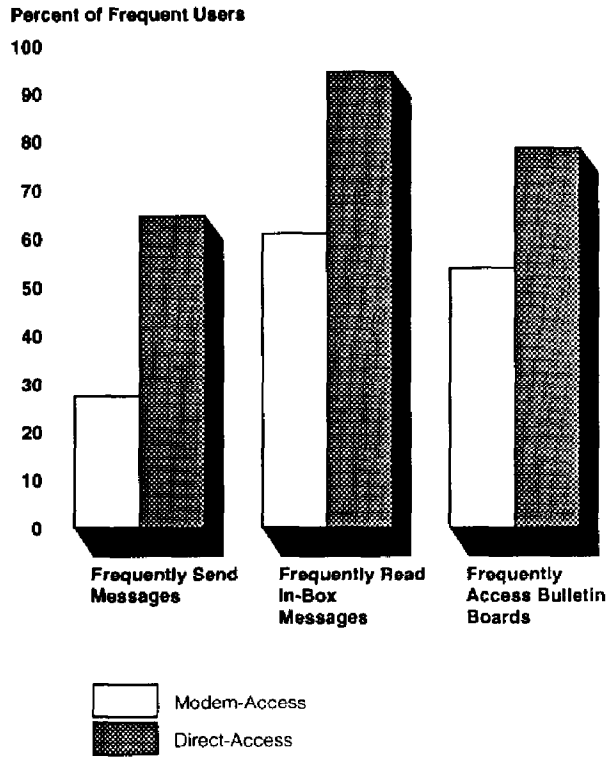
Many staff also noted that the direct-access setting provided access to laser printers, which improved product quality. They said that the laser printers produced products of higher quality and produced them faster, making them "infinitely better than the old dot matrix beasts." Another benefit was the fact that the direct-access network provided the same, current version of each software application, which was easier to maintain.

**Types and
Frequency of Tasks
Performed**

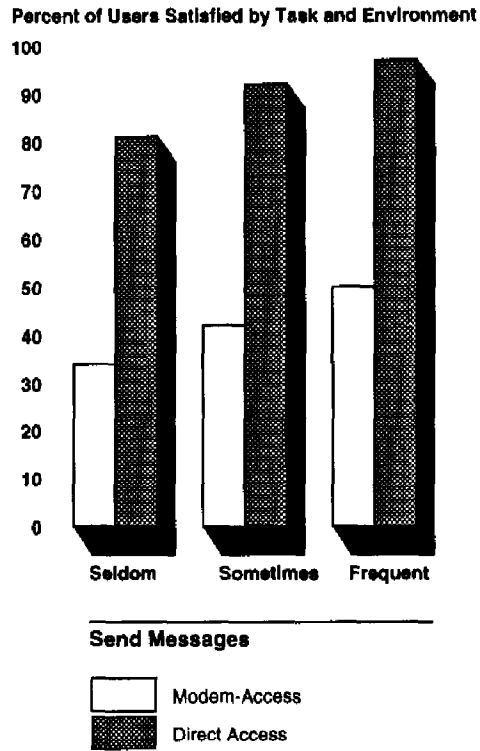
Staff in a direct-access network environment sent and read messages and accessed bulletin boards more frequently than staff with modem access.⁴ They were also more satisfied with their direct-access setting than staff using modems for these tasks. Specific details for each are shown in figures 5 and 6:

⁴The frequency of tasks is defined as: frequent = several times a week or more, sometimes = several times a month, and seldom = once a month or less.

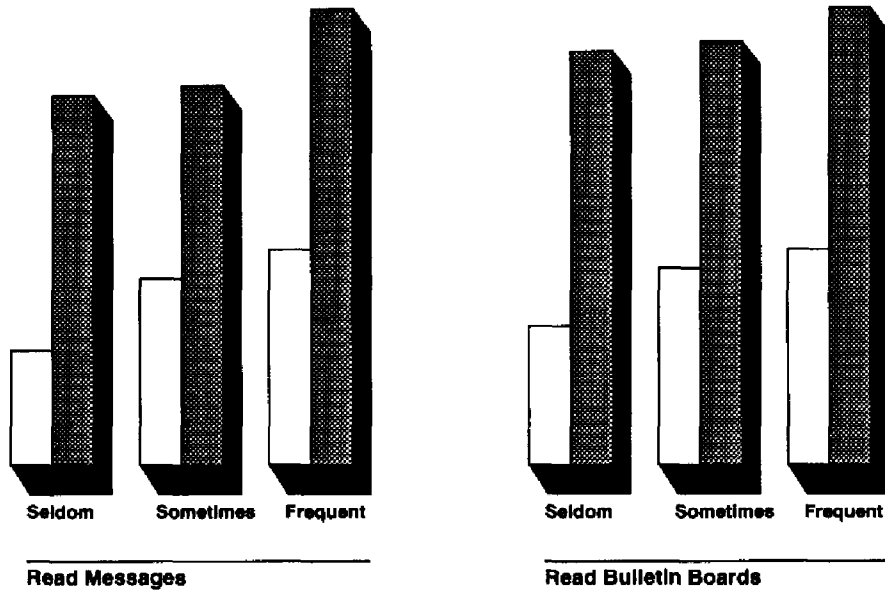
Figure 5: Direct-Access Environment Shows More Frequent Use



**Figure 6: the More
Frequent the Use, the
More Satisfied the User**



Questionnaire Results



Most staff said that the direct-access setting provided a much better means to communicate and coordinate with team members at various locations. Many staff said they no longer faxed or sent hard copies of information because the electronic mail feature was so quick and efficient. They also noted the convenience of sending files to staff in different time zones. With direct access, there was no need to wait

until the appropriate time to call and transfer information.

Staff using modem access complained that this was slow, difficult, and unreliable. Some said that this dial-up process was a waste of time and discouraged network use because they frequently could not make connections. Other respondents noted that once they had gained access, the system was too slow and that they sometimes were automatically "thrown out" if they did not use the accessed feature frequently enough to maintain the connections.

**Time Allocated to
Assignment Tasks**

We asked staff whether they spent less, more, or about the same amount of time to complete various tasks in a direct-access LAN setting compared with a stand-alone setting. About 60 percent of the respondents said they allocated less time for tasks such as sending and receiving files, finding appropriate software and printers, and communicating with headquarter and regional office staff. They also provided comments on how the direct-access network affected time needed to complete tasks. The following comments are representative of the predominant reasons for why they needed less time.

- "I did not have to worry about conflicting schedules to send and receive files—could just send the files at any time and they would be immediately available for the recipient."
- "Sending products via the direct-access environment seems to result in more timely responses."
- "It requires fewer steps to accomplish tasks and they could be completed at your desk—less time spent faxing, copying, waiting for information."
- "You don't have to conduct searches for software or printers. In a stand-alone setting, I wasted a lot of

Questionnaire Results

productive time trying to locate a computer or waiting in line to use a printer.”

While most staff indicated that with direct access they spent less time for tasks, some said that they allocated more time. But the reason given was because direct-access was such an easy and efficient means to communicate and share information. They said that as a result, they were better informed and more productive. In addition, most staff who said that they allocated more time performing various tasks indicated that they were satisfied with the direct-access setting. As shown below, whether staff with direct access allocated less or more time for various tasks, they were satisfied, as illustrated in table 3:

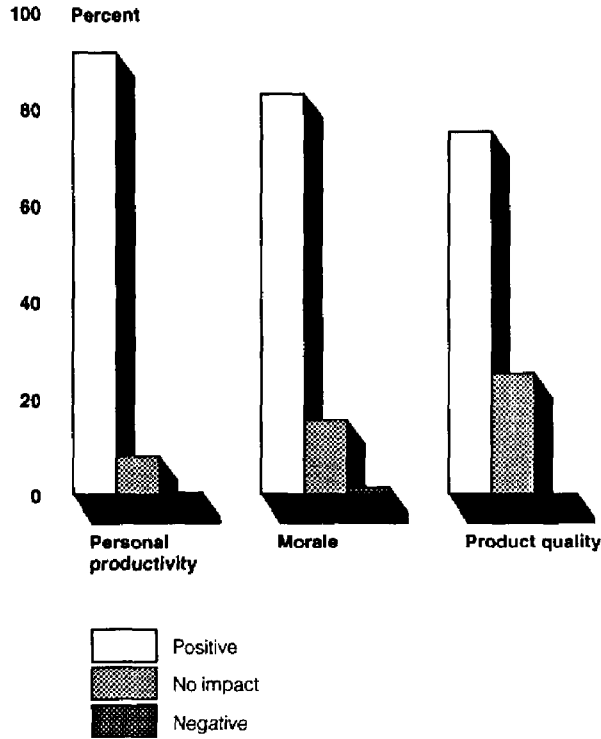
Table 3: Time Allocated to Assignment Tasks and Staff Satisfaction

Task	Staff who allocated less time (number)	Satisfied (percent)	Staff who allocated more time (number)	Satisfied (percent)
Send and receive files	192	95.8	52	90.4
Find appropriate printers	194	97.4	63	81.0
Find appropriate software	181	98.3	45	84.4
Communicate with headquarters	197	97.0	73	94.5
Communicate with regional offices	111	97.3	25	92.0

Impact of Direct-Access Network on Work Quality

Staff indicated that the direct-access environment had an overwhelmingly positive impact on their personal productivity, morale, and product quality. In addition, direct access rarely, if ever, had a negative impact on these areas, as shown in figure 7.

Figure 7: Impact of Direct-Access Network on Productivity, Morale, and Product Quality

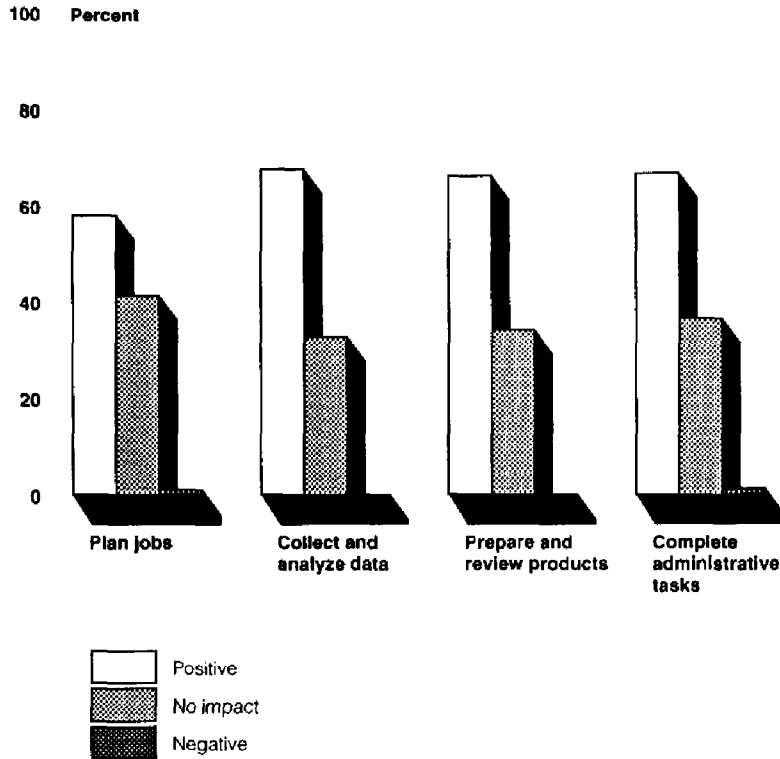


We also looked at the relationship between staff responses regarding the time they spent for various tasks in a direct-access setting and their responses regarding the impact this setting had on the above areas. Ninety-five percent of the staff (about 180) who said that they spent less time sending and receiving files and finding the appropriate software and printers also said that the direct-access network had a positive

impact on their productivity. About 87 percent and 82 percent, respectively, said that this also had a positive impact on their morale and product quality.

In addition, for most respondents, direct access had a positive impact on their coordination efforts to plan jobs, collect and analyze data, prepare and review products, and complete administrative tasks, as shown in figure 8.

Figure 8: Impact of Direct-Access Network on Assignment Tasks



Effect of a GAO-Wide Network

We asked staff to indicate whether a GAO-wide network would increase their work quality. They supported this primarily because it would provide increased and enhanced communications, access to more information, and time savings. But they stressed that a GAO-wide network must be in a direct-access setting to be efficient and effective. The following comments are representative of the views expressed by the staff:

Questionnaire Results

- "A GAO-wide network would provide me the ability to easily and quickly communicate and share information throughout GAO, making me more productive and provide more time to do a quality job. Also, access to information will make it possible to make better decisions and more complete analyses."
- "It would be great. It would help with our coordination efforts with other divisions and to develop and share ideas. We would also have more access to people with expertise in different subject areas. Do it!"
- "I could communicate with people in other units more rapidly. This would be beneficial in planning meetings and sharing data and text. It would reduce turn-around time in getting agreement."
- "A GAO-wide network would improve the quality of my work if everyone is hardwired [direct-access] so they can make effective use of the network. It makes no sense having half of GAO in a modem-access environment."
- "Only if I had direct-access would the LAN increase the quality and productivity of my work."

Training Needs

We asked staff to indicate whether they needed training in various software applications or in how to use the network. Most—almost 70 percent—indicated that they did not need any training for word processing, electronic mail, and network operations. Over 65 percent said they needed some training—basic, intermediate, or advanced—for using graphics and data base management software. There was also a high level of interest—about 60 percent—in learning more about calendar and schedule software applications. A tabulation of all responses is provided in Appendix I.

Questionnaire and Tabulated Responses

United States General Accounting Office

GAO

Survey of Computer Environments Used by GAO Staff

INTRODUCTION

The purpose of this questionnaire is to provide information on the impact that technology—computers, software, printers, and the GAO local area network (LAN)—has had on the work we do at GAO. Specifically, this survey focuses on how GAO staff use *information technology to carry out work assignments.*

Your responses will be used to help make decisions regarding the acquisition and application of technology resources in the future. The Mission Support Project team will use this questionnaire data and other information collected throughout the project to define user requirements for the technology needed to carry out GAO's mission.

Please return your completed questionnaire to Christie Motley in Room 6468 in GAO's headquarters building. If you have any questions please call Christie Motley at (202) 275-0693 or Nancy Oquist at (202) 275-5350.

PART I-DEFINITIONS

Throughout this questionnaire we will refer to three types of computer environments. During fiscal year 1992 you may have worked in more than one of these environments.

Non-LAN environment: This type of environment is commonly known as a "stand-alone" environment. When you use this type of environment you cannot gain access to the hardware, software, and files on the GAO LAN.

LAN modem-access environment: In this type of environment the user can access the hardware, software, and files on the GAO LAN by a modem attached to the computer.

LAN direct-access environment: In this type of environment the user can access the hardware, software, and files on the GAO LAN without using a modem, because the computer is directly cabled to the LAN.

NOTE: For staff at the RCED/EPA audit site, you are not in a LAN direct-access environment. You are in a LAN modem-access environment; you access printers and network options by using a modem and data switch set-up that streamlines the dial-up process.

Thank you for your assistance.

INFORMATION IS PROVIDED IN PERCENTAGES

**Appendix I
Questionnaire and Tabulated
Responses**

PART II-BACKGROUND INFORMATION

1. What is your division or regional office? (N=699) (Check one.)
 - 11.0 RCED (headquarters building)
 - 7.6 RCED/DOT site
 - 6.2 RCED/AG site
 - 5.9 RCED/EPA site
 - 19.3 Other RCED audit site
 - 29.9 HRD (One Massachusetts Avenue)
 - 3.4 HRD audit sites in Baltimore
 - 14.2 San Francisco Regional Office
 - 2.4 Sacramento sub-office

2. How many years have you worked at GAO? (Round to the nearest year)

_____ years

3. What is your current grade? (N=699) (Check one.)
 - 8.7 GS-8 and below
 - 25.9 Band I / GS-7 to GS-12
 - 48.1 Band II / GS-13 and GS-14
 - 14.2 Band III / GS-15
 - 3.0 SES / Above GS-15

4. Which of the following describes your job role, regardless of your formal position description? (N=699) (Check one.)
 - 12.6 Clerical, secretarial, or administrative support staff
 - 59.9 Band I and Band II evaluator or evaluator-related staff not in a specialist group
 - 11.7 Band III evaluator or evaluator-related staff not in a specialist group
 - 9.2 Specialist (DMTAG, TAG, or EAG member in a specialist group)
 - 3.3 Unit Manager (Directors, Regional Managers, Division Directors, etc.)
 - 3.3 Other (Specify)

5. Based on the definitions in Part I, which one of the following best describes your computer environment in fiscal year 1992? (N=699) (Check one.)
 - 39.1 LAN direct-access for the whole year → SKIP TO QUESTION 7
 - 22.5 LAN modem-access for the whole year → SKIP TO QUESTION 7
 - 2.6 Non-LAN for the whole year → SKIP TO QUESTION 7
 - 25.0 Mixed, but currently LAN direct-access → CONTINUE WITH QUESTION 6
 - 6.6 Mixed, but currently LAN modem-access → CONTINUE WITH QUESTION 6
 - 2.6 Mixed, but currently non-LAN → CONTINUE WITH QUESTION 6
 - 1.7 Did not use a computer in fiscal year 1992 → SKIP TO QUESTION 18

6. Of all the time you spent using a computer in the past fiscal year, about what percent did you spend in each of the following environments? (N=330)
 - 47.5% LAN direct-access environment
 - 20.8% LAN modem-access environment
 - 32.0% Non-LAN environment

**Appendix I
Questionnaire and Tabulated
Responses**

PART III-COMPUTER ENVIRONMENT USE

7. How often (if at all) did you perform each of the following tasks in the computer environments listed in the table below? (Answer each question using one of the following numbers.) (N=687)

- 1= Frequently (several times a week or more)
- 2= Sometimes (several times a month)
- 3= Seldom (once a month or less)
- 4= Not applicable

TASKS	Computer Environment		
	Percent of "Frequently" responses		
	Direct-access	Modem-access	Non-LAN
1. Send messages	43.7	11.9	////////
2. Read inbox (personal) messages	64.9	27.8	////////
3. Read bulletin board (shared) messages	53.7	23.9	////////
4. Access policy/ procedure information	4.9	1.2	////////
5. Access MATS information	1.6	0.3	////////
6. Access division and/or regional MIS	5.5	1.6	////////
7. Send data files (e.g., from WordPerfect, spreadsheets, data bases)	8.6	1.2	1.7
8. Store data files	28.8	6.1	14.8
9. Access shared data files	7.0	1.9	2.5
10. Access word processing software	58.1	10.2	18.2
11. Access spreadsheet software	15.6	1.9	6.7
12. Access graphics software	7.0	1.2	3.5
13. Access data analysis software (e.g., FoxPro, SAS, SPSS)	5.1	0.4	3.8
14. Access GAO Telephone Directory	12.5	0.9	1.0
15. Access printers	53.3	10.0	15.0
16. Other (SPECIFY)	1.2	0.1	0.1

**Appendix I
Questionnaire and Tabulated
Responses**

PART III-COMPUTER ENVIRONMENT USE

7. How often (if at all) did you perform each of the following tasks in the computer environments listed in the table below? (Answer each question using one of the following numbers.) (N=687)

- 1= Frequently (several times a week or more)
- 2= Sometimes (several times a month)
- 3= Seldom (once a month or less)
- 4= Not applicable

TASKS	Computer Environment		
	Percent of "Sometimes" responses		
	Direct-access	Modem-access	Non-LAN
1. Send messages	15.4	12.4	//////////
2. Read inbox (personal) messages	2.3	8.6	//////////
3. Read bulletin board (shared) messages	9.0	8.7	//////////
4. Access policy/ procedure information	7.3	2.3	//////////
5. Access MATS information	6.3	1.3	//////////
6. Access division and/or regional MIS	9.5	2.8	//////////
7. Send data files (e.g., from WordPerfect, spreadsheets, data bases)	19.1	6.8	3.9
8. Store data files	11.6	4.1	2.9
9. Access shared data files	9.2	2.0	1.0
10. Access word processing software	3.3	2.9	2.0
11. Access spreadsheet software	14.1	2.8	4.8
12. Access graphics software	10.8	1.7	4.8
13. Access data analysis software (e.g., FoxPro, SAS, SPSS)	5.5	0.4	1.7
14. Access GAO Telephone Directory	15.6	4.1	0.3
15. Access printers	5.5	2.8	2.3
16. Other (SPECIFY)	0.7	0.4	0.0

**Appendix I
Questionnaire and Tabulated
Responses**

PART III-COMPUTER ENVIRONMENT USE

7. How often (if at all) did you perform each of the following tasks in the computer environments listed in the table below? (Answer each question using one of the following numbers.) (N=687)

- 1= Frequently (several times a week or more)
- 2= Sometimes (several times a month)
- 3= Seldom (once a month or less)
- 4= Not applicable

TASKS	Computer Environment		
	Percent of "Seldom" responses		
	Direct-access	Modem-access	Non-LAN
1. Send messages	8.9	21.0	//////
2. Read inbox (personal) messages	2.0	10.3	//////
3. Read bulletin board (shared) messages	6.3	12.7	//////
4. Access policy/procedure information	42.4	32.6	//////
5. Access MATS information	38.7	30.4	//////
6. Access division and/or regional MIS	31.0	26.8	//////
7. Send data files (e.g., from WordPerfect, spreadsheets, data bases)	31.9	28.7	9.6
8. Store data files	21.1	25.2	2.9
9. Access shared data files	34.2	27.4	8.6
10. Access word processing software	6.1	22.7	2.2
11. Access spreadsheet software	26.9	27.1	8.7
12. Access graphics software	36.2	28.1	10.6
13. Access data analysis software (e.g., FoxPro, SAS, SPSS)	34.1	25.3	8.0
14. Access GAO Telephone Directory	27.4	27.7	6.1
15. Access printers	5.7	17.9	3.1
16. Other (SPECIFY)	0.6	1.9	0.6

**Appendix I
Questionnaire and Tabulated
Responses**

PART III-COMPUTER ENVIRONMENT USE

7. How often (if at all) did you perform each of the following tasks in the computer environments listed in the table below? (Answer each question using one of the following numbers.) (N=687)

- 1= Frequently (several times a week or more)
- 2= Sometimes (several times a month)
- 3= Seldom (once a month or less)
- 4= Not applicable (includes respondents who left the item blank)

TASKS	Computer Environment		
	Percent of "Not Applicable" responses		
	Direct-access	Modem-access	Non-LAN
1. Send messages	32.0	54.7	//////////
2. Read inbox (personal) messages	30.7	53.3	//////////
3. Read bulletin board (shared) messages	31.0	54.7	//////////
4. Access policy/procedure information	45.4	63.9	//////////
5. Access MATS information	53.4	68.0	//////////
6. Access division and/or regional MIS	54.0	68.9	//////////
7. Send data files (e.g., from WordPerfect, spreadsheets, data bases)	40.5	63.3	84.7
8. Store data files	38.4	64.6	79.3
9. Access shared data files	49.6	68.7	87.9
10. Access word processing software	32.5	64.2	77.6
11. Access spreadsheet software	43.4	68.3	79.8
12. Access graphics software	46.0	69.0	81.1
13. Access data analysis software (e.g., FoxPro, SAS, SPSS)	55.3	73.8	86.5
14. Access GAO Telephone Directory	44.5	67.4	92.6
15. Access printers	35.5	69.3	79.6
16. Other (SPECIFY)	97.5	97.5	99.3

**Appendix I
Questionnaire and Tabulated
Responses**

8. Thinking about the **software packages** you most often use, how easy or difficult has it been to access and use them in each of the computer environments listed below? (*Software packages include word processing, spreadsheet, data base, and graphics packages.*)

Direct-access computer environment (N=620)

61.5 Very easy
12.5 Somewhat easy
3.4 Neither easy nor difficult
1.0 Somewhat difficult
0.5 Very difficult
21.3 Do not use software in this environment

Modem-access computer environment (N=541)

10.9 Very easy
10.7 Somewhat easy
5.7 Neither easy nor difficult
9.8 Somewhat difficult
7.8 Very difficult
55.1 Do not use software in this environment

Non-LAN computer environment (N=478)

52.1 Very easy
14.0 Somewhat easy
4.0 Neither easy nor difficult
3.1 Somewhat difficult
1.0 Very difficult
25.7 Do not use software in this environment

9. Thinking about the **printers** you most often use, how easy or difficult has it been to access and use them in each of the computer environments listed below? (*Printers include dot matrix, laser, and postscript printer.*)

Direct-access computer environment (N=609)

48.1 Very easy
16.7 Somewhat easy
5.4 Neither easy nor difficult
4.8 Somewhat difficult
2.8 Very difficult
22.2 Do not use printers in this environment

Modem-access computer environment (N=530)

11.1 Very easy
9.4 Somewhat easy
3.8 Neither easy nor difficult
7.2 Somewhat difficult
5.5 Very difficult
63.0 Do not use printers in this environment

Non-LAN computer environment (N=469)

33.0 Very easy
20.5 Somewhat easy
5.1 Neither easy nor difficult
9.0 Somewhat difficult
2.8 Very difficult
29.6 Do not use printers in this environment

10. In fiscal year 1992, did you use a LAN direct-access computer environment enough to become familiar with its advantages and disadvantages relative to a Non-LAN computer environment? (N=682) (*Check one.*)

57.9 I am familiar enough to make comparisons
42.1 I am not familiar enough to make comparisons → SKIP TO QUESTION 15

**Appendix I
Questionnaire and Tabulated
Responses**

11. When you performed the following tasks, did you spend less, more or about the same amount of time in a LAN *direct-access computer environment* as compared to non-LAN environment? (Check one for each.)

TASKS	Do not perform task	Much less time in LAN direct-access	Somewhat less time in LAN direct-access	About the same amount of time in LAN direct-access	Somewhat more time in LAN direct-access	Much more time in LAN direct-access	Number of responses
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Communicating with other GAO headquarters units staff	17	40	14	11	6	13	381
2. Communicating with other GAO regional units staff	46	24	7	17	1	6	378
3. Coordinating with other GAO headquarters units staff—such as on data collection and analysis, developing report products and administrative tasks	36	25	12	17	3	7	382
4. Coordinating with other GAO regional units staff—such as on data collection and analysis, developing report products, and administrative tasks	54	17	7	17	2	3	379
5. Sending and receiving data files via computer	23	40	13	10	6	8	378
6. Finding appropriate software	12	34	15	27	4	8	375
7. Finding appropriate printers	11	38	15	19	6	11	373
8. Printing information from the computer to paper	5	40	13	21	9	12	378
9. Using a fax machine to send and receive information	18	19	11	47	2	3	365
10. Photocopying information so you could send a hard copy	15	22	16	42	3	2	362
11. Using express, regular, or pouch mail to send hard copies of information	22	22	12	40	1	3	362
12. Waiting for hard copies of information to arrive	16	28	14	39	1	3	356
13. Other (Specify)	63	13	6	13	6	0	16

12. If you spent less time using a LAN *direct-access computer environment*, please explain why in the space below.

**Appendix I
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Responses**

13. Did working in a LAN *direct-access computer environment* have a positive, negative, or no impact on the quality of work in the following areas? (Check one for each.)

	Amount of Impact						Number of responses
	Very Positive (1)	Somewhat Positive (2)	No impact (3)	Somewhat negative (4)	Very negative (5)	No basis to judge (6)	
COORDINATING WITH HEADQUARTERS UNITS ON:							
1. Job planning (developing and coordinating assignment plans, issue area plans and job starts, etc.)	19	23	29	0	0	29	379
2. Data collection and analysis (develop interview write-ups, spreadsheets, and graphics; analyze workpapers; search and retrieve information for use at decision points)	30	25	26	0	0	22	379
3. Product preparation and review (retrieve workpapers, revise products to respond to reviews)	30	23	26	0	0	21	376
4. Administrative activities (prepare travel, training, annual assessment documents and other forms)	23	29	31	1	0	16	381
COORDINATING WITH REGIONAL UNITS ON:							
5. Job planning	9	12	24	0	0	56	373
6. Data collection and analysis	9	12	24	0	0	55	373
7. Product preparation and review	14	11	23	0	0	52	374
8. Administrative activities	14	15	25	0	0	47	374
GENERAL WORK AREAS							
9. Your personal productivity	54	34	9	1	0	2	384
10. Quality of your products	40	33	25	0	0	2	383
11. Your capability to do new kinds of applications	38	34	23	0	0	5	383
12. Your morale	47	33	17	1	0	2	384

14. If you indicated either very negative or very positive impact for some areas, please explain why.

**Appendix I
Questionnaire and Tabulated
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15. Overall, how satisfied or dissatisfied are you with each of the following computer environments as an effective way to coordinate with people, send and receive messages and files, and access information, software and printers?

	Do not use this environment (1)	Very satisfied (2)	Somewhat satisfied (3)	Neither satisfied nor dissatisfied (4)	Somewhat dissatisfied (5)	Very dissatisfied (6)	Number of responses (7)
1. Direct-access computer environment	24	52	19	4	0	1	645
2. Modem-access computer environment	36	6	19	10	20	9	604
3. Non-Lan computer environment	32	15	22	13	12	7	553

16. Please explain your level of satisfaction below. If possible, provide examples which describe why you feel that way.

**Appendix I
Questionnaire and Tabulated
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PART IV-OTHER ISSUES

17. Thinking about the **communication software packages** you most often use, how easy or difficult has it been to work with them? *(Please consider the effort spent locating a modem, establishing a connection, as well as using the software.)*

pcANYWHERE (N=669)

- 67.1 Do not use this package
- 9.3 Very easy
- 10.9 Somewhat easy
- 5.2 Neither easy nor difficult
- 5.7 Somewhat difficult
- 1.8 Very difficult

CoSession (N=663)

- 63.2 Do not use this package
- 7.2 Very easy
- 9.5 Somewhat easy
- 6.0 Neither easy nor difficult
- 10.9 Somewhat difficult
- 3.2 Very difficult

CrossTalk (N=676)

- 38.0 Do not use this package
- 14.5 Very easy
- 16.9 Somewhat easy
- 7.4 Neither easy nor difficult
- 17.9 Somewhat difficult
- 5.3 Very difficult

Kermit (N=662)

- 92.9 Do not use this package
- 2.3 Very easy
- 2.4 Somewhat easy
- 1.1 Neither easy nor difficult
- 1.2 Somewhat difficult
- 0.0 Very difficult

18. Please indicate whether you need training in the areas listed below. *(Check one box per row.)*

AREAS OF TRAINING	I need _____ level training				Number of responses
	(1)	(2)	(3)	(4)	
1. Wordprocessing or text editing	67	5	13	15	654
2. Spreadsheets	43	25	21	11	653
3. Graphics	32	38	21	9	664
4. Data base management	34	45	15	6	657
5. Statistical Analysis System	49	37	9	5	654
6. Statistical Package for the Social Sciences (SPSS)	54	36	7	3	651
7. Communications with other GAO locations	55	28	13	4	666
8. Communications outside GAO (other data bases)	42	48	6	4	660
9. Electronic mail	70	13	11	5	663
10. Automated Calendaring	38	56	5	2	656
11. Automated Scheduling	40	55	5	1	653
12. Fundamentals on how to use the LAN	67	15	12	6	662

**Appendix I
Questionnaire and Tabulated
Responses**

19. Which of the following best describes the computer you most frequently used during fiscal year 1992? (N=692) (Check one.)

- 2.0 A computer shared with one or two other people
- 7.4 A computer shared with more than 2 people
- 88.6 A computer in my office or cubicle which is rarely shared → SKIP TO QUESTION 21
- 1.6 Other (Specify)

- 0.4 I do not use a computer → At right, briefly describe why, then SKIP TO QUESTION 21

20. Because you most often shared a computer during fiscal year 1992, about how much effort did you take to perform the following activities? (Check one for each.)

ACTIVITIES	Amount of Effort					
	Very little effort (1)	Little effort (2)	Some effort (3)	Moderate amount of effort (4)	Great amount of effort (5)	Number of responses (6)
1. Looking for an available computer because someone was using the one you usually use	37.5	0.0	25.0	6.3	31.3	16
2. Returning missed telephone calls	37.5	0.0	25.0	12.5	25.0	16
3. Leaving the computer to retrieve relevant workpapers and documents from another location	31.3	12.5	25.0	0.0	31.3	16
4. Becoming familiar with computer (i.e., particular model)	50.0	0.0	37.5	12.5	0.0	16
5. Becoming familiar with software that is accessible by the computer you use	56.3	6.3	18.8	18.8	0.0	16
6. Finding another computer because others needed to use the computer you were on (i.e., being bumped)	43.8	0.0	31.3	12.5	12.5	16

21. If a GAO-wide network were in place, please describe why you feel this environment would or would not increase the quality of your work.

Thank you for your assistance!

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