

A RAND NOTE

Retirees Using EMail and Networked Computers

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Introduction

Purpose and Scope of This Paper

Personal Computers, electronic mail and networking are usually associated with the children of retirees; not with the retirees. Technology diffusion into the retiree community has been discussed in previous articles in this journal, (Festervand & Wylde, 1988). Technology awareness, affordability, the user's education, and the user's prior technological exposure clearly affect a technology's adoption. But does computer technology have a *real* role in retirees' lives? And, even if there was a need for more technology in their lives, *could* older people learn to use computers effectively?

We believe the answer to both questions is "yes."

To justify these beliefs, we will first explain how we taught retirees to use a computer network. Then we will discuss the methods we used to observe the patterns and levels of computer network activity of this diverse selection of retirees. Feedback from people is very important during the installation of a communications network. In closing we discuss some of our impressions based on these network observations.

A Case Study of Technology Adoption

Before going into these details, here is a brief sketch of how a group of retirees with little previous personal computer ("PC") experience

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adapted a sophisticated network of computers and telecommunications technology to their *own* purposes. The John and Mary R. Markle Foundation supported this RAND field experiment, (March 1987-March 1988) to see if computer based communications can establish and maintain relationships between geographically dispersed groups of retirees and employees. Can computer networks contribute to social structures and interpersonal interactions?

We created two task groups from retired and working employees of the Los Angeles Department of Water and Power, (DWP). The DWP is one of the largest employers in the greater Los Angeles area. 80 volunteers were recruited and randomly assigned to either an "electronic" or "standard" task force. Both groups were asked to prepare a report for the DWP about the transition to retirement in today's policy environment.

Both groups included an equal number of recent retirees and employees, similar in age and status and eligible to retire. Meeting rooms, phone service, postage, and so on were provided for each. In addition, members of one task force were provided with networked desk top personal computers. They were called the "electronic group." Members of the "standard group" had no computers.

The PC is a IBM/XT clone, with 640K memory, a 20 megabyte hard drive, a 2400 baud modem and a near letter quality printer. Each computer has a word processor, spread sheet, database, games, and electronic mail (EMail) software. EMail allows users to send memo-like messages, documents, databases, and programs to members throughout the network. Electronic users did not need to learn DOS commands. Instead they selected items in a screen menu to run various programs.

The "electronic" group used the computer communications features in the cooperative work environment. At the end of the one year study, the electronic group requested that RAND assist their acquisition of this "experimental" system. The Markle Foundation has underwritten RAND's task of turning the system over to the users. The retirees call their volunteer service group, DWPCNET.

Today, there is a network of 28 computers. All twenty (20) of the original "retired electronic group" opted to remain in the group. Eight (8) of the original 20 "working electronic group" remained with the group. Available EMail licenses allow for the eventual expansion to 35 PCs. The group is actively recruiting new members to use this software.

The DWPCNET group sees itself as a retiree volunteer service/social group. They do not see themselves as a computer club. While seven of

the twenty eight members are willing to learn how to maintain the system, the direction and focus of the DWPCNET is volunteer service.

The Learning Experience

Training Materials

While there were varying levels of computer experience, none of the members had ever used electronic mail or worked on a computer network. Training required familiarizing the group with the computer hardware, the menu screen and the electronic mail and text processing programs. This material was presented in four formats:

- Introductory Presentation
- Individual Training Session
- Follow up Sessions
- "Expert" Members

The Introductory Presentation was a slide presentation to the group that stressed two things. First, hardware slides showed the group what new appliances they would be receiving. Second, the word processing, electronic mail, spreadsheet, database and game programs were individually previewed. The presentation stressed that while the equipment was probably "new" to everyone, the applications were "time tested" tools of the office place. The work processor was a recast typewriter. The spreadsheet program was an elastic "accounting sheet" that could stretch in "two directions." The database was the successor to the "3x5" cards that sat in everyone's office. Electronic Mail was a "memo" machine that could "telex" office memos and documents over a telephone line. Members were urged to concentrate on how they would use typewriters, memos and spreadsheets in their ordinary work context, when using the computer.

Individual training sessions averaging three hours were held in homes (retired subjects) or offices (working subjects). The subject was reintroduced to the computer as it was unpacked, assembled and tested on its desk. The individual was presented with three topics:

1. the menu screen
2. the software collection
3. how to get help.

First the individual was taught how to use the computer's menu screen to select programs and user options. Second the user was introduced to EMail and word processing. Both programs were taught using step by step cue cards that showed the user how to call up the program and how to use its various features. The cue cards were structured in the context of an actual working session. The third topic of "getting help" closed the session. Repeatedly the individual was told during the session that notes were unnecessary since the narrative of this training session was provided in an accompanying RAND Manual (Bikson, et al., 1987). We wanted the subject to concentrate on the computer screen and the keyboard. Cue cards in each section showed the user how to select and use the software. The original software manuals were provided as reference material. The users were shown how to use electronic mail to get assistance from RAND technical staff. In addition the users were given a RAND phone number to call for direct personal assistance.

Follow Up Sessions included a single visit to all the homes and offices three months after system installation to verify that all computers were operating correctly. Questions about the system were answered at this time. All other training interactions were group meetings called by the retirees. As an example, when it became clear that the task force's own project would require a database, sessions were held to train people how to enter, edit and analyze (summaries and crosstabs) data.

"*Expert Members*" soon emerged from the ranks, who helped tutor others. One retiree who had been in charge of training programs at the DWP, developed on-line BASIC tutorials for the group. Members exchanged files and basic programs to familiarize each other with the capabilities of the computer. As members became more familiar with their PC's, they became increasingly dissatisfied with the constraints the menu screen (a DOS shell program) placed on them. The tutorial writing member also began to tutor his fellow members on the DOS operating system. On occasion, members would create "crib sheets" to explain how complex tasks, (i.e. editing an autoexec.bat file) could be accomplished by the most naive user.

Methods: How We Evaluated the User's Activity

Survey Information: All participants were interviewed at baseline and at three subsequent intervals. Retirees were asked to evaluate the network's effects and to give their subjective evaluations of the computers, the software and the group. Sociometric data include reported

degree of familiarity with other participants and reported contacts of several types.

Message Traffic and Organization Information: Intragroup contacts via electronic mail were also mapped automatically in the electronic task force. Formal subgroup structures (e.g., committees) were tracked throughout the period of work as well. These data allowed us to learn by controlled comparisons about the difference that electronic mail makes for a geographically distributed group and, within the electronic group, to examine its relationship to other types of interactions and outcomes (e.g., task involvement, friendship formation).

Technical Support: There were two ways to contact the RAND technical support people. First, users could send an electronic message to RAND for help. Electronic mail messages were answered in roughly a day. Users could also make toll free phone calls to RAND to the same technical staff answering electronic help requests. A record was kept of all help requests. The help request was characterized on three levels. First, did it come by telephone or electronic mail? Second, did the problem relate to hardware, software or organization issues? Third, was the problem a "BUG" or "USAGE" problem? "BUG" problems were reports of hardware or software defects. "USAGE" problems were requests for more instruction on the use of either hardware or software.

User Activity: All computers had a program that recorded all user activity on the computer. Whenever a person used a program, a session record was created. On a daily basis it recorded the session's time and duration, the number of keystrokes and the name of the program used. All data was transmitted to RAND overnight, when the computers were not in use. All subjects knew this recording device was running.

Confidentiality: All RAND research is subject to review by the RAND Human Subjects Protection Committee. This committee strictly insures that RAND data collections do not violate subject's privacy and confidentiality rights. All data logging programs erased the text of messages between users. Numbers were substituted for names, to increase the confidentiality of the data, and message subject lines were removed.

Findings: How the Computer Network Was Used

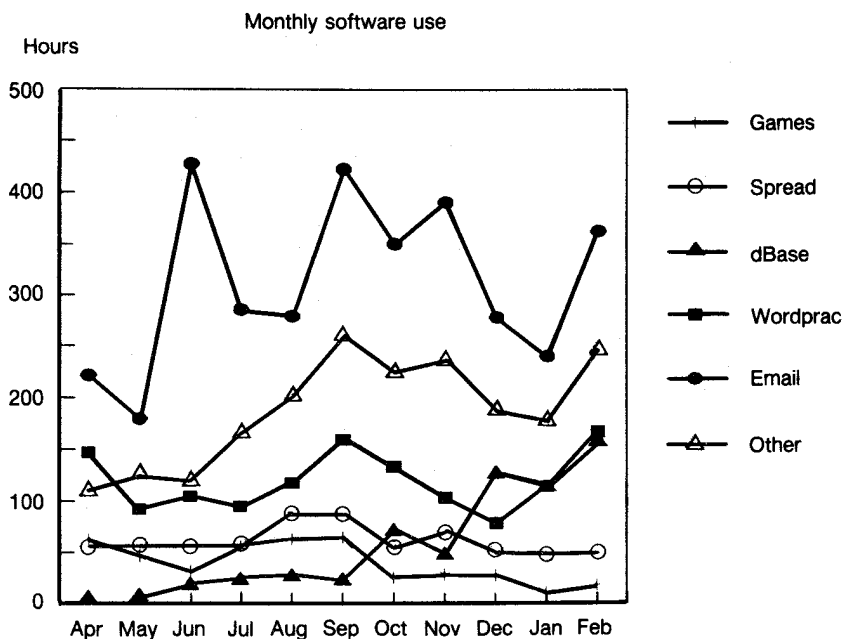
Organizational Findings: The computer's communications advantages were dramatic. Differences appeared almost immediately in the

project year. First, EMail substantially alleviated the time and space constraints that accompany conventional group work. Distance from the workplace and degree of participation in work group interactions were negatively correlated in the standard task force but were not statistically associated in the electronic task force. We also observed, by analyzing time stamps on electronic mail, that retirees and employees in the "electronic" group tended to use the computer on different time schedules. This can reflect lifestyle differences between the workers and the retirees. EMail allowed task members to distribute messages and documents instantaneously. The electronic "holding bins" allowed workers to choose their own hours for processing their share of the work. Perhaps the most striking observation is that the retirees in the electronic group had much higher participation rates than employees in either group by the end of the experimental period, (Eveland & Bikson, 1988). The retirees had more time to learn about computers than their working counterparts. They also were not pressured at the workplace to only use the PC's *during free time*.

User Activity: A "session record" is defined as the number of key-strokes and the number of minutes that a user spends on a program listed on the Menu. Figure 1 illustrates the total number of minutes, users spent on the 6 software packages, (games, spreadsheets, databases, word processors, electronic mail and "other programs"). Initially, games are the first most sought after programs. The menus and cursor commands familiarize the user with the keyboard. By the second month, electronic mail and word processing are the dominant programs. Because spreadsheets were more familiar to the group than databases, the spreadsheet was the preferred means of data displays. Only in July of 1987, when the task force got interested in surveys and databases did the use of the database exceed the spreadsheets. Throughout the entire study, the subjects spent most of their time reading and sending out messages. The primary use of the PC was communication. The second most used item was "other software." "Other" indicates a program that was not included in the experimental bundle. This indicates that users quickly begin to customize their computers to suit their own needs.

The Variability of the Users' Experiences: The aggregate measures (total time per month) illustrate the capacity demands people placed on their computers. When trying to distinguish how different people use the computers, the most dominant discriminant was the employment status (worker -vs- retiree). Some of the twenty working subjects were

Figure 1
Total Hours Software Usage Hours per Month

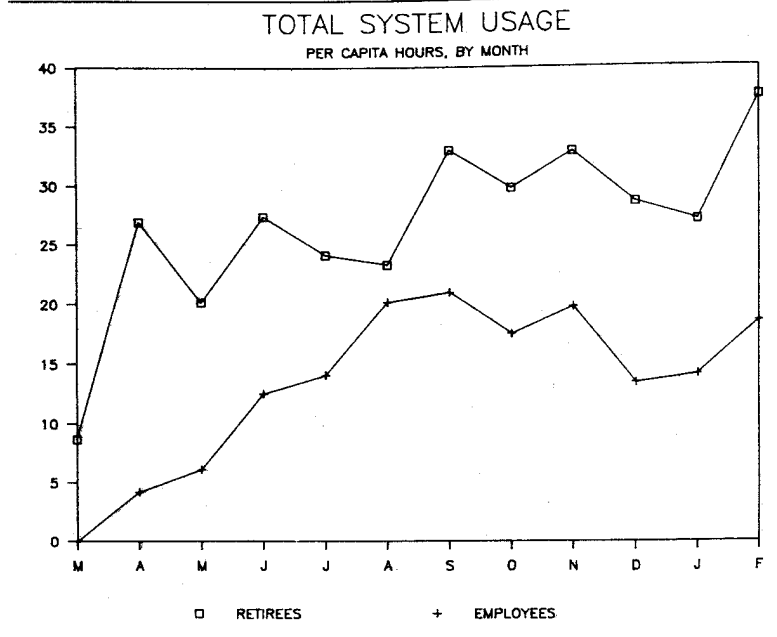


indirectly discouraged from full participation by their supervisors. Workers were told to use the PC's when they had "free time." Figure 2 illustrates the general pattern of the total home and office usage of the system. Usage in the summer months of August is approximately the same for workers and retirees, (20 hours per capita per month) toward the end of the summer when retirees went away. By September, retirees returning to California sent usage levels climbing again, to roughly 25 hours per month. Workers dropped back to the mid teens per capita.

Technical Support: User Support must be flexible to a task group's growing expertise and needs. Technical support findings can be expressed in three dimensions:

- Time Patterns: When did they ask?
- The nature of the questions: What did they ask?
- The source of assistance: How did they send the request?

Figure 2
Per Capita Usage (Retired and Working) per Month



Time Patterns: Technical support requests came through EMail and the telephone. Help requests usually arrived around the noon hour. While telephone calls were answered only between 6:00 A.M. and 6:00 P.M., electronic messages arrived all day long with a lull between 3:00 P.M. and 6:00 P.M. There was an initial month long flurry of calls during the installation phase as users learn to use their PC's. All subsequent peaks seem to coincide with the year's task deadlines.

The Nature of the Question: Help requests were categorized into hardware, software and organization issues. Hardware calls remained flat through the year, at roughly 15 calls per month. Hardware calls usually were reports of failed hard drives or monitors. Quite often the unit had not failed, but had been operated improperly. Software and organization issues dominated the support requests during the first seven months at about 50 calls apiece. During the last five months of the study, hardware and software calls dropped off and organizational calls rose to well over a 150 calls per month. The initial seven months

were spent learning how to use the system. The final five months, calls to technical support were task related. How can meetings be scheduled? Who could create subcommittees for tasks being delegated?

The Source of Assistance: Over the year, we fielded 1275 help requests. 64% of these arrived by EMail. A balance of 464 (36%) arrived by telephone. Much of this activity comes from a minority of the membership. Of the 1275 help requests, 3 (7.5% of the group) accounted for the first quartile of the calls. Another 5 individuals, (12.5% of the group) accounted for the second quartile of the calls. Seven, (17.5% of the group) individuals made up the third quartile of users. The lowest quartile was held by 20 individuals (half the sample). Five individuals (12.5%) didn't place any calls for help.

The number of calls placed had much to do with rank in the electronic task force's committee structure. With the exception of one, all committee chairs ranked in the top two quartiles of members requesting help from the RAND staff. Only two employees placed in the top three quartiles. All members who never placed help requests were employees. This reflects the dominant role that retirees played in this electronic network. Workers found it difficult to find "free time" to contribute to the effort.

Survey Findings: During the experimental year subjects were asked about their use of the computer and their participation in the electronic task force projects. Sociometric analysis shows that initially those working in the office reported more interaction with fellow task members than the retirees. By the end of the year, "electronic retirees" reported contact levels about 50%. "Standard workers" reported contact levels of about 37%. "Electronic employees" had contacts with about 20%. The "standard retirees" without computers were the most distant group reporting levels never higher than about 6%. The computer definitely assisted the retired electronic members. The workers with computers did not make as much use of their PC's due to office pressures.

Over the course of the year, the working and retired electronic people were asked their impressions of the computers with a rating scale (5 = very much and 1 = very little). Retirees considered the computers more helpful than the workers. Retirees consistently ranked the computers more highly than the workers with respect to a computer being "fun," "gratifying," or a "challenge." Neither the workers nor retirees in the electronic group found computer use unpleasant. There was no

statistically significant difference between the low adjectives they selected ("little" to "very little") in reaction to questions if the computer was "intimidating," "frustrating" or "disappointing." Retirees consistently used and subjectively ranked computers more highly than the workers. As retirees demanded more from their PC's however, there is a statistically significant rise in the level of frustration with the hardware.

Conclusions

Can older people adopt computer and telecommunications technology? Yes. The persistence of the DWPCNET indicates that computer networks can easily become integrated into the lives of retirees. The fact that DWPCNET sees itself as a retiree volunteer group instead of a computer club emphasizes how older people can take a technology to heart. In this study, EMail increased the interactions within the electronic group. It was consistently ranked positively in surveys by its users. The activity and support logs make it clear that the electronic task force took at least 7 months to become familiar with the computers. General questions about computers are replaced with project oriented questions. Database, electronic mail and word processing dominate the closing months. Had a more random selection of programs persisted, (equal frequencies of games, word processing, spreadsheets, etc), it would be difficult to assert that the system was task oriented.

Can older people learn to use computers? Yes, but to varying degrees. Older adults must be given multiple sources of instruction. For some, the manual sufficed. For others, repetitive, step by step instructions were required. This instruction material included class presentations, individual lessons, functional "cue cards," manuals, and expert peers. Periodic meetings where members would watch each other "make mistakes" increased member's willingness to experiment with the system. Periodic stimulation (deadlines or meetings) was shown to correlate with the activity on the network. Peer "experts" are a very important source of tutoring.

Should computers be introduced into the workplace for retiring workers? Some researchers have suggested that retirement anxieties may be reduced if workers increase communications with retirees. In this instance, the answer is no. Worker participation is stifled by the irony of allowing workers to use the PC's only during "free time." Few

workers are willing to admit that they have "free time." A more productive option might be to place PC's in the homes of these workers. RAND's technical staff expected the working electronic group to dominate the activity, since these members would be able to ask each other questions about the operation of the computers. The inhibitions of the workplace over rode this potential advantage. Several workers who were very inactive when the PC's were in their offices have become very active, with the PC in the home. One of these workers has even become one of the more active committee heads of the new DWPCNET.

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