COMPUTER ASSISTED COMMUNICATIONS

A Study of Computer Conferencing
and
Messaging--Networks and Users

March 1980

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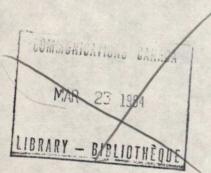A Study of Computer Conferencing
and
Messaging--Networks and Users

March 1980

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COMPUTER ASSISTED COMMUNICATIONS
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EXECUTIVE SUMMARY

The stimulus for this study came from two years experience on computer conferencing and messaging networks including the large Electronic Information Exchange System (EIES). The experience resulted in the belief that this means of communication is just in its early stages and will have a potentially large socio-economic impact on the information market of the future.

The study is a descriptive one whose purpose is to enquire into computer conferencing and computer messaging to see what systems are operating and what are the impacts on the users.

The basic data for the suty was gathered in an exploratory survey; from EIES, and from telephone interviews with 30 users of EIES and 25 or more users in other computer networks.

The results of the interviews showed that the use of computer conferencing and messaging (CCM) systems had some impact on work-style and on life-style. Also, different types of users have different usage patterns.

Academics, professionals, and consultants using the EIES network made use of a portable terminal, usually at home, accessed on average once a day consuming about 2 to 3 hours per week.

In the business community, the most active users send and receive 40 messages a day and take the terminal home on week-ends--or they have a terminal at home already. Changes in work-style were observed. The manager/secretary relationship is a more co-operative one, where with terminals on each of their desks, they keep in touch with international representatives more easily, come to consensus on issues more quickly, arrange meetings and agenda more effectively.

Business people frequently bring home the portable terminal, or use the one at home to keep in touch with the affairs of the company. The survey revealed that some people became addicted to CCM and some families thought the use of a terminal at home was a threat to, and competition for, family time together.

Six criteria of successful conferencing and messaging were identified, three of which were particularly critical to the future of this type of communication:

      1. cost,
      2. purpose and pay-off,
      3. terminal accessibility.

Potential use of the <u>conferencing</u> mode has broad applications, especially when dealing with complex subjects and issues, and when dealing with personnel widely disbursed geographically. Arranging international meetings, discussing research projects, getting consensus on business issues, are typical applications of the conferencing medium.

The computer <u>messaging</u> future depends to a large extent on lowering the cost of operation and equipment required. When the costs are appropriate the market would appear to have growth potential both for business administration and for personal communication.

PART I

INTRODUCTION

INTRODUCTION

1 BACKGROUND AND PURPOSE

The increasing use of computers, particularly of the mini and micro variety, is widening considerably the varieties of communication that can now be called Computer Assisted Communication. This study will focus on that part of computer assisted communication that includes the use of computer terminals and a host computer to conduct computer conferencing and computer messaging. This will be referred to throughout the study as Computer Conferencing and Messaging (CCM).

The stimulus for the conception of this study came from personal experience with several computer communication networks over the past two years and the resulting belief that this will be a significant means of communication in the rapidly growing Information Society. The Department of Communications agreed that it would be useful to do a study that would look further into this particular type of communication; identify the systems that are operating; enquire from users what the impacts might be, and also look at potential uses and problems for this type of communication.

The prime example of CCM to be described and examined, both from the standpoint of its structure and the reaction of its users, was the Electronic Information Exchange System operating internationally out of New Jersey. An objective of the report is to identify and investigate other CCM networks, such as hobby networks and others. A further objective was to ask users of various CCM networks how they used the systems, how often, for what reasons, and to assess the impact on their work-style and life-style.

Credit for a great deal of the resource material for this study must be given to the two people in the Electronic Information Exchange System (EIES) who provided the opportunity for the EIES experience--Dr. Murray Turoff, Director of the Computerized Conferencing and Communications Center,

New Jersey Institute of Technology, and Dr. Joseph Martino, Research Institute, University of Dayton, Dayton, Ohio, and to the National Science Foundation of Washington, D. C. which has been funding the EIES program.

2 APPROACH AND METHODOLOGY

Because of the wide variety of ways of communicating in which the computer can now be used, the first step in the study was to define the particular applications with which this report is concerned. The definition and description of computer conferencing, computer messaging and how this relates to electronic mail, was therefore a first considera- tion. It should be noted here that the study was done from the point of view of the user rather than the technologist or specialist in computers and communications.

The EIES network comprised of some 700 academics, scientists, technologists and consultants was the prime focus of the study. The structure of this system was examined, and statistical performance data obtained. Users were then queried on their use of the system. Thirty EIES members were contacted, either by phone or by messaging on EIES. The sample was chosen at random from the set that had been on- line during accessing the system in January and February 1980. The information sought related to their use of the system, its impact and its future:

- what terminals they used, whether at the office, at home, and/or on travel;
- what other networks were being used;
- the use made of conferencing, messaging and the news bulletin;
- frequency of access and length of time on line;
- problems of learning to use the system;
- the professional value;
- impact on travel;

- impact on family where terminals were used at home;
- the future of such conferencing/messaging services.

Enquiries were then made of other CCM networks and systems, and some 22 were found. Interviews were then conducted throughout Canada and the U.S., mostly by telephone to enquire as to the size, nature and purpose of the system and to obtain information on impacts and implications where this was possible.

A number of networks were found in the business community, used for business administration purposes, and it soon became evident that the companies contacted represented only a small part of the total activity in this field. The companies reported, therefore, are only an illustration of the kind of computer communication that is taking place within such organizations.

A set of 6 possible criteria for successful conferencing and messaging was prepared which was useful as background for the interviews, and in order to assess why some of the CCM systems were successful and why some were not.

3 REPORT STRUCTURE

Part I then deals with the purpose and the approach that has been used in the development of this report. The definitions and descriptions of the process of computer conferencing and computer messaging and the relationships to electronic mail are dealt with in Part II. Part III sets out the findings of the survey of the EIES network and of the 30 participants. Also, the results of the interviews with some 25 people on other CCM networks and systems are in this section. In Part IV is an analysis and assessment of the findings from the survey and potential uses of and problems of computer conferencing/messaging systems. In Part V, Summary Observations, the patterns of usage of conferencing and

messaging are summarized and the growth and future potential of CCM are proposed. Finally, a future scenario of the home use of CCM is presented.

PART II

DESCRIPTION OF COMPUTER ASSISTED COMMUNICATIONS

DESCRIPTION OF COMPUTER ASSISTED COMMUNICATIONS

Computer assisted communication includes a variety of means of communication where the computer is involved. This study is confined to computer conferencing and computer messaging which is described below, along with a number of types of electronic mail.

1 COMPUTER CONFERENCING

Computer conferencing is a way of holding a conference without people attending at the same time or in the same place. It was developed in the U.S. in the early 70's and these beginnings are well described in Hough and Panko.[1] Conferencing as currently practised has a number of features in addition to one-to-one messaging. The user addresses the conference membership as a group, using the typewriter-like keyboard of a computer terminal. The typed text is then transmitted by telephone connection to the host computer. Members of the conference have the text presented to them, on their computer terminal, when they access the system. Individuals respond, again to the group in like manner. The system permits separate conferences, or sub-conferences, on specific topics or for specific purposes. Support services are usually provided such as key-word search, member directories, participant status reports, messaging facilities, news bulletins, and in some cases information banks on relevant subjects. Users of computer conferences, as found in the survey, were companies managing large projects around the world, two government agencies which used computer conferencing in dealing with the international aspects of their responsibility, and a body of individuals, mostly academics and professionals (EIES). In the latter group were many sub-sets of computer conferences with specific purposes such as

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1. Hough, R.W., and Panko, R.R. "Teleconferencing Systems: A State of the Art Survey and Preliminary Analysis". Stanford Research Institute, Menlo Park, California, April, 1977.

exchanging information on proposed legislation, or discussing
rehabilitation and devices for the disabled. Possibly the
most notable characteristic of computer conferencing was the
variety of purposes for which this medium was used.

Hiltz and Turoff[2] describe computer conferencing in this
manner:

> "The conference is a topic-oriented discussion in
> which a permanent transcript is built up of the
> proceedings. A conference will typically last
> from a week to a few months, with participants
> entering and leaving the discussion at their
> convenience, and taking as long as they need to
> reflect on previous entries or consult references
> or data before responding. Each research group
> has one or more conferences, and every individual
> belongs to one or more groups. Since 'intel-
> lectual mobility' is simple on EIES, it is a
> frequent occurrence for a member to join a
> conference of interest in another research
> specialty, as well as to participate in conferences
> set up by his/her own group."

2 COMPUTER MESSAGING

Computer messaging consists of sending a message from the
keyboard of a terminal (or computer) to another member of
the computer network via the host computer. The computer
acts like a mailbox which holds the input message until the
addressee asks for it. In some cases, the message can be
sent directly to the addressee if the terminal or computer
at the receiving end is prepared to accept it.

A number of computer message networks were found in the
survey. Computer service companies sell messaging packages
to organizations which use them to administer their business
affairs. Some government agencies use computer message
systems to facilitate their operations among geographically
separate offices. Some message systems have certain

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2. Starr Roxanne Hiltz and Murray Turoff, "The Network
   Nation", Addison-Wesley, Don Mills, Ontario, 1978.

characteristics of conference systems, such as multiple addressing, the differences being in the programming and not in the equipment. Systems can, of course, have a number of features combined--e.g. conferencing, messaging and information retrieval.
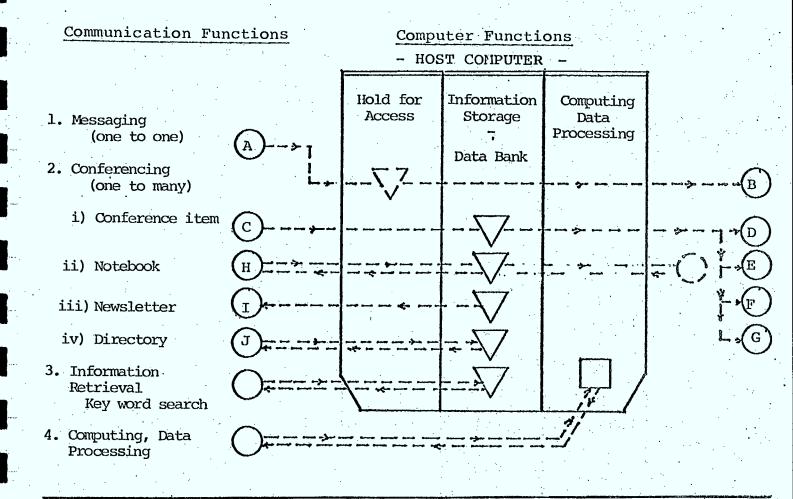
Equipment commonly used for computer conferencing and messaging of this kind includes a computer terminal with CRT display or hard copy print-out, a telephone to communicate the information in digital form, and a host computer.

Figure 1 shows in diagrammatic form the relationship between computer conferencing (from an individual to a group) and computer messaging (one-to-one communicating) and the other functions commonly available on the computer. Figure 2 shows the concept of a CCM network, people at remote locations communicating through the central host computer. The locations of people and the host computer suggested by the diagram are typical of the EIES network and similar ones now in operation.
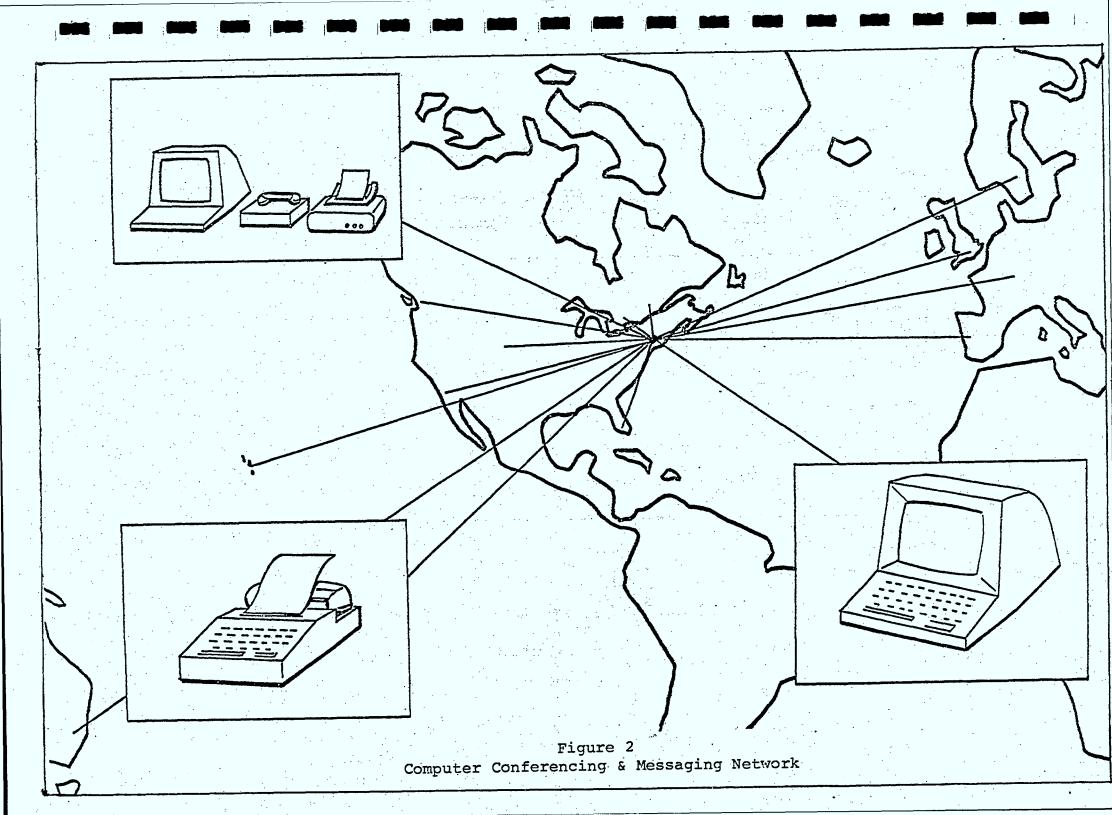
3. ELECTRONIC MAIL

Computer messaging is often called electronic mail. However, electronic mail is more a generic term that includes many forms of electronically assisted message sending. Input/ output devices can take a variety of forms including computer terminals with typewriter keyboards and CRT display screen, and/or printer; facsimile machines; Telex machines; word processors. A computer capability is provided either as a host central computer usually some distance from the input/output devices, or through micro computers built into the devices themselves, or any mixture of these. The following are some forms of electronic mail.

Figure 1

Schematic of Conferencing, Messaging & Computer Relationships

Communication Functions

1. Messaging
   (one to one)

2. Conferencing
   (one to many)

   i) Conference item

   ii) Notebook

   iii) Newsletter

   iv) Directory

3. Information Retrieval
   Key word search

4. Computing, Data Processing

Computer Functions

- HOST COMPUTER -

Hold for Access

Information Storage
- Data Bank

Computing Data Processing

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1. Messaging (one to one) - A sends message to B. Computer holds until B accesses through his terminal, and "picks up his mail".

2. i) Conference input from C sent to group (D,E,F,G,). Computer holds for access by D,E,F,G. Computer stores for future reference & retrieval, by number or key-word.

   ii) Conference member H puts items in notebook. Edits, adds & deletes. May invite access & input by others.

   iii) Conference member I receives Newsletter; input by Conference staff member.

   iv) Conference member J enters name and data on self in Directory; searches for names of others by key-word.

3. Client company searches data bank for information.

4. Client company does data processing.

Figure 2
Computer Conferencing & Messaging Network

3.1 Telepost (Mailgram in the U.S.A.)

Using Telex machines for input, messages are sent via
the Telex network to the addressee's nearest post
office, then put into 1st class mail for delivery the
following day. Input can also be from magnetic tape.

Telepost began in 1972. Volume for the financial year
1978-79 was over 400,000 messages sent which was 87%
above the previous year. Volume in the first nine
months of 1979/80 was 680,000 messages.

3.2 Intelpost

Intelpost is a system of facsimile-generated international
electronic mail recently inaugurated by Canada Post
Office (April 1980). A message scanner sends the
facsimile data via computer communication networks to
the international destination where it is delivered in
a similar manner to Telepost.

3.3 Infotex

Infotex is currently under development by CN/CP. It
will use a range of terminals for input, from intel-
ligent typewriters to communicating word processors,
and transmit through CN/CP's digital switching network.
Output will also be from terminals. "Store and forward"
facilities will be provided by buffers in the receiving
terminals, which will always be open to receive messages.

3.4 Word Processors

Word processors can, if equipped with the communications
package, send text from the diskette storage on one
machine to that of the next via the regular telephone

system and thus be a form of electronic mail. The
machine at the receiving end must be ready to accept
the message if there is not an intermediary host computer
or built-in microcomputer capability to provide the
store-and-forward function.

3.5 Home Computers

Home computers can now be hooked into the mail system.
According to the EMMS newsletter[3], Radio Shack has
developed a package so owners of their TRS-80 home
computers can input messages to the U.S. Mailgram
service; and there are more than 150,000 of these
TRS-80 computers installed in the U.S.

Other systems of a similar kind are in the process of
development, so it is apparent that the term "electronic
mail" takes many forms.

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3.   "Electronic Mail & Message Systems", Norwal, Conneticut,
     Volume 3, No. 21--Nov. 1, 1979.

PART III

SURVEY FINDINGS

SURVEY FINDINGS

1 INTRODUCTION

In addition to EIES some 22 other systems or networks were
identified and participants contacted. These included both
conferencing and messaging systems and some were mixtures
of the two. Twelve of the 22 were messaging systems used
by large and small compnies in the administration of their
daily business affairs. The additional CCM systems
identified and described include:

- a conferencing system for the management of
  large projects;
- a conferencing system, that had reverted to a
  messaging system for exchanging information nation-
  ally in a government communications directorate;
  and a similar situation in a government health
  directorate (D.O.C., NMUD);
- two conferencing systems operating internationally
  for scientists to discuss issues, exchange informa-
  tion, develop policy and organize meetings
  (Geoscience Centre, SAM'S CLUB);
- a computer subscription service for individuals, to
  provide a broad selection of data base retrieval
  and message exchange--and even an electronic publish-
  ing opportunity (The Source);
- a community terminal access to a local community
  "Bulletin Board" for citizen information exchange
  (Community Memory);
- a network for deaf people (DEAFNET);
- a family information exchange;
- a local messaging system for computer buffs (CBBS)
  (a series of 50);
- a local message system for ham radio/computer
  hobbyists (Radio-Packet).

Some changes in life-styles and work-styles were experienced
by users in the EIES network and in the business systems
resulting from these new communication patterns. These
findings are reported below, beginning with EIES, followed
by the business networks and then the other group of CCM
users.

2 FINDINGS: ELECTRONIC INFORMATION EXCHANGE SYSTEM (EIES)

This section deals with the special characteristics of the
EIES network drawing on direct experience with the system
and using data from it. First, there is a brief description
of the structure of the system and of the various types of
conferences. Then, overall performance characteristics are
presented from EIES data, and finally an analysis of
responses from interviews with some 30 members of the system.

2.1 Structure

The Electronic Information Exchange System (EIES) is
a computer conferencing system operating out of the
Computerized Conferencing and Communications Center of
the New Jersey Institute of Technology. Murray Turoff
and Starr Roxanne Hiltz provide the direction for this
activity. Turoff has been pioneering in computer
conferencing since he was involved in the application
of computers to communications in the U.S. Office of
Emergency Preparedness in the Nixon Administration in
the late 60's.

EIES has been funded as a large communications experiment
by the National Science Foundation. The support of the
Foundation ends April 1st, 1980, and plans are being
made to find other means of support in order to continue
the pioneering work of this operation. There are
expected to be user fees to carry, or help carry, the
overall cost.

EIES has prepared a number of Fact Sheets to describe the operation of the system and the new fee structure. These are shown in Appendix 1.

There are approximately 700 members on the EIES network, most of whom are in the continental United States. Others are located in Hawaii, Canada, France and other European countries.

EIES can be said to be comprised of five types of communication and information packages:

- conferencing;
- messaging;
- notebooks;
- a news bulletin;
- a directory of members.

Conferencing and messaging have been described generally in Part II, but will be covered in more detail here as applied in EIES. First, a few comments on the other features of the system, i.e. notebooks, news bulletin, and the directory of members.

2.1.1 Notebooks

Notebooks are available to members and these are personal (or group) working files, where material is typed in for study, revision or the build-up of a paper or perhaps a research project. The editing function is provided. Several people can input a notebook and together conduct a joint authorship function.

2.1.2 Bulletin

The Bulletin feature on EIES is in the form of
a weekly newsletter called CHIMO, and is available
to all members every Monday morning. By typing
+WEEKLY the latest CHIMO is displayed on the
CRT or print-out facility. The resource material
that comes out on CHIMO can be very useful to
the members, through announcing meetings,
conferences, describing or advising of events,
and often including instructions on new uses of
EIES features. An index of CHIMO is shown in
Appendix 2. It illustrates the information
resource than can accumulate over a couple of
years, and that is available to members on
request. It is, in fact, difficult for one
who has a normally busy life to take full
advantage of all the information resource and
communications potential of this network.

2.1.3 Directory

The directory of members is a useful data base
to help people understand, and find, one another.
A typical entry includes the name and address
of a particular person, the working affiliation,
and the conferences and groups to which the
person belongs. Also, space is provided for the
inclusion of activities, plans or other items
of interest which the member includes about
himself or herself.

2.2 Conferences (public and private)

Conferencing on the computer (as well as conferencing
without the computer) takes a lot of organizing and
human attention to ensure that participants are properly

taken care of, in the interest of achieving conference objectives. The EIES network, conference moderators and group co-ordinators are appointed to facilitate and stimulate the interaction, provide guidance and perhaps to stop or re-direct the action.

User consultants and system monitors are also provided to answer questions, give guidance and directions to the process. The role of these facilitators of the conferencing activitiy is described in the Hiltz-Turoff book (The Network Nation, p.23).

Conferences on the EIES network can be public or private. In a public conference, anyone can access and participate. In a private conference there is a particular membership, open only to invitees. A list of public conferences is shown on page 17.

EIES PUBLIC CONFERENCES

CONFERENCE TITLE	CONFERENCE #
Practice	1000
Poetry Corner	1001
Problems & Suggestions	1002
Impacts	1003
Notices	1004
"Wisdom"	1005
Terminals	1006
Explanations	1007
Conferences & Notebooks	1008
Opportunities	1009
Information Science	1010
Interdisciplinary Rsch	1011
Ethics & Futures	1012
Information Systems	1013
Hobby Computing	1014
AII	1015
Future Scenarios	1016
Paper Fair	1017
Berlin-WFSC	1018
Alternative News	1020
Computers in Education	1021
Library Future	1022
Privacy	1025
Act Fair	1026

A typical public conference would be c1003 IMPACTS, or
C1014 HOBBY COMPUTERS. It is customary to outline
the purpose of a conference in the first item. These
are shown below for these two conferences.

```
C1003 CC1  ROXANNE HILTZ (ROXANNE.120)   8/27/79   5:49 PM  L:24
(ORIG.)                                 10/23/76   2:15 PM5 PM

welcome to the public conference on impacts. this is the place
where we ask you to discuss anything having to do with the
perceived or potential impact of the system on individual
users, user groups, or the society.
this can range from your own personal reactions to the
experience of using the system,to predictions of how the
nature of life in our society would be changed if most people did most
of their communicating over systems of this type.

An index to the contents of this conference will be constructed and
peridically updated     in comment one, should you wish to selectively
retreive items.

Comment numbers     subject
2                   "over-joining"
2-7                 lost non-verbal cues
8                   initial user reaction
9-11                handling output
12,13,15,17         information overload
16,18,20            comparisons to cb
19,21,22,23,25      proper name for the medium
26                  impacts on libraries
77-78               summary hypotheses derived from analysis of EIES
trial use data
81-97               monthly usage summary data
99-123              the terminal in the home-- impacts on the family
125-129             EIES in your dreams
```

```
C1014 CC1  MIKE BALTRUSH (MIKE.953)   5/22/78   11:21 AM  L:6
KEYS:/WELCOME/

     Welcome to the conference on HOBBY computing. This will be
an informal rap session for a while until ( or when and if) topics
begin to surface. Then we can pick a bunch of keywords and continue
on as before with a veneer of structure so that people can pick
and chose amongst the wheat and chaff. Fortunately no two people
are going to agree which is which, so let's start.
```

There is no limit to the size of a conference but usually they range from 10 to 50 members. The programming permits recall of any individual entry to a conference or group discussion as all of them are individually numbered. Participants can set markers so only the unread items will be presented to them, or they can request one or a series to be shown.

A list of private conferences is shown below:

EIES GROUP AND PRIVATE CONFERENCES

CONFERENCE TITLE	CONFERENCE #
General Systems Theory	40
Glossary GST	41
Genealogy and History	42
Science Policy	43
Communication Nets	44
1985 Scenarios	116
CC Group Forms	213
Decentralization	313
Visionary/Creative Msmt	314
Structural Modeling	318
Field Research	353
Social Network Theory	378
Disciplinary Matrix	400
Talk about Talk	401
Instructional TV	402
Requisite Variety	403
Schemes & Categories	404
Amer. Soc. for Cybernetics	409
Information	410
Evolution	415
SGSR Task Force	416
System Formation	418
SGSR/AAAS Panel	426
Hierarchy Theory	428
Educational Programs	437
Course Outlines	438
Annotated Bibliography	439
Rural Telenet Use	448
Test Questions	449
Technology Transfer	457
Community Information	820
Cerebral Palsy School	944

A typical private conference or group discussion is
Group 30, on futures research. The first item outlines
the original purpose of the discussion.

```
C30 CC1   JOSEPH P. MARTINO (JOEM,30U)   11/29/77   8:24 AM  L:11
KEYS:/WELCOME/

4TO ALL MEMBERS:
   WELCOME TO THE FUTURES RESEARCH CONFERENCE.  I HAVE BEEN
LOOKING FORWARD TO GETTING THIS CONFERENCE STARTED SINCE I
FIRST DISCUSSED IT WITH ALL OF YOU WHILE I WAS WRITING
THE PROPOSAL.  I HOPE WE ALL GAIN ENOUGH BENEFITS FROM THE
CONFERENCE TO HAVE MADE IT WORTH WHILE.  REMEMBER, THE
CONFERENCE IS NOT INTENDED TO BE SOMETHING YOU "HAVE" TO
DO. IT IS INTENDED TO BENEFIT YOU IN THE CONDUCT
OF YOUR OWN RESEARCH.  I HOPE YOU WILL MAKE EXTENSIVE AND
EFFECTIVE USE OF THIS CHANNEL OF COMMUNICATION WITH YOUR
COLLEAGUES IN THE FUTURES RESEARCH COMMUNITY.
```

Status reports are available to participants and these
are useful for the moderators in keeping the group alive
and interactive.

As an example of the various uses a member can make of
the communication network provided by a conference, note
the following:

```
M 14192   XXXXXXXXXEXXXXXXXXXXXXXXXXXXXX   7/ 2/79   2:56 PM  L:9
KEYS:/SURVEY OF STRATEGIC PLANNING PRACTICES/
TO: (GROUP 30), (GROUP 40)

     I've been invited to conduct a collaborative survey of strategic
planning practices among major corporations. This should be an
attractive opportunity for corporate planners to share ideas and to
get to know one another better. I was hoping that some of you
could assist by putting me in touch with the planning departments of
some firms you may know of that might like to participate in this
project. This promises to be an important and interesting study, so
I would greatly appreciate your help and I would be happy to offer
you a copy of the survey results. Thanks.
```

A unique private conference in the EIES group of
conferences and discussions is called LEGITECH.
It is really a series of conferences and discussions
where the membership is comprised chiefly of science
and technology specialists attached to state legis-
latures. The purpose is to provide a forum for the
discussion and mutual help in the preparation of
legislation at the state level. It is an interesting
and apparently effective use of the computer conferencing
procedure.

In the illustration on page 22 is a series of enquiries
from members of LEGITECH asking for information from
other members about such subjects as computer crime,
school equalization, re-refined oil. The procedure
requires that the question to be posed be stated in two
lines and support information be provided separately,
available only to those who request it. The moderator
of conference 700 asked if such a conference would not
be useful in Canada. Such a possibility would certainly
seem to exist.

EXAMPLE OF LEGITECH CONFERENCE

```
WAITING:
 37 INQUIRIES
ACCEPT WAITING LEGITECH ITEMS (Y/N)?Y

N74 NP55  VERNER R. EKSTROM (OKLEG,715)   2/22/79  11:47 AM  L:12
KEYS:/INQUIRY #55/COMPUTER CRIME/

TOPIC:
COMPUTER CRIME
QUESTION:
WHAT LAWS OR BILLS EXIST RELATING TO COMPUTER CRIME?



SELECT ABOVE INQUIRY TO RECEIVE BACKGROUND, RESPONSES, AND LEADS?
SELECT INQUIRY (Y/N)?Y

BACKGROUND:
CUSANOVICH OF CALIF. HAS INTRODUCED A BILL WHICH WOULD MAKE IT A CRIME TO
DIRECTLY OR INDIRECTLY ACCESS OR CAUSE TO BE ACCESSED ANY COMPUTER,
CMPUTER SYSTEM OR COMPUTER NETWORK FOR THE PURPOSE OF DEFRAUDING.
WE WOULD BE INTERESTED IN A COPY OF THIS BILL OR OF ANY OTHER BILLS
OR CITATIONS TO STATUTES IN THIS IMPORTANT AREA.

N74 NP56  VERNER R. EKSTROM (OKLEG,715)   2/22/79  12:18 PM  L:13
KEYS:/INQUIRY #56/SCHOOL EQUALIZATION/

TOPIC:
SCHOOL EQUALIZATION
QUESTION:
WE ARE INTERESTED IN THE EXPERIENCE OF OTHER LEGISLATIVE GROUPS WITH THE
SIMULATION OF SCHOOL EQUALIZATION FORMULAS.


SELECT ABOVE INQUIRY TO RECEIVE BACKGROUND, RESPONSES, AND LEADS?
SELECT INQUIRY (Y/N)?N

N74 NP57  G.WILLIAM HARBRECHT (MTLEG,717)   2/22/79   6:22 PM  L:10
KEYS:/INQUIRY #57/REREFINED OIL/

TOPIC:
REREFINED OIL
QUESTION:
DO ANY STATES HAVE PROGRAMS WHICH ENCOURAGE THE USE OF REREFINED OIL?
HOW IS THE RECYCLING PROGRAM HANDLED,HAVE THERE BEEN ANY COMPLAINTS,
HOW SUCCESSFUL, HAS THE PROGRAM BEEN?

SELECT ABOVE INQUIRY TO RECEIVE BACKGROUND, RESPONSES, AND LEADS?
SELECT INQUIRY (Y/N)?Y

BACKGROUND:
WE WOULD APPRECIATE RECEIVING ANY INFORMATION ON THE RECYCLING OF OIL
AND THE USE OF REREFINED OIL.HAVE THERE BEEN ANY STUDIES WHICH SHOW
REREFINED OIL DOES OR DOES NOT MEET NEW VEHICLE SPECIFICATIONS?
```

2.3 Performance Patterns

2.3.1 Traffic on the System

Each month, the EIES program develops an up-dated
set of statistics for the traffic on the system
in terms of items and lines composed and received,
for messages, conferences and notebooks. This
is produced for the system as a whole, for
separate groups of members and for individuals.

For the system as a whole, for the month of
January, 1980, there were 6,736 messages composed,
and 14,832 received by addressees. The difference
in the two numbers is accounted for by multiple
addressing for messages sent. In conference
activity, there was a total of 1,797 items
composed and put in conference "mailboxes".
Because of the wide coverage of each conference
item, the number of items received or read by
participants was 22,817. There were 11,100
sign-ons (times-on) into the system by the EIES
members in January, 1980. The average length
of time a user is on-line at one time, is 22
minutes for January, 1980, and 24 minutes to-
date. Table 1, on page 24, shows the overall
system statistics for January, 1980, and cumula-
tive to January 1st.

TABLE 1

SYSTEM STATISTICS
for January 1980

	Month of January 1980		Cumulative Total As of February 1st 1980	
	ITEMS/LINES COMPOSED	ITEMS/LINES RECEIVED	ITEMS/LINES COMPOSED	ITEMS/LINES RECEIVED
MESSAGES:				
PRIVATE:	6467/77076	10800/134977	137720/1523946	243047/2753938
GROUP:	269/2039	4032/35080	4697/43064	76360/813522
CONFERENCES:				
GROUP:	461/5212	8841/121978	8932/142652	167836/2894377
PRIVATE:	919/12240	7136/107442	29352/445496	230547/3815559
PUBLIC:	417/3239	6840/85455	5164/81701	123945/2145180
NOTEBOOKS:				
GROUP:	12/341	58/1846	2982/22000	4917/135859
PRIVATE:	585/15782	460/13037	13546/273804	18256/395186
PUBLIC:	70/1439	441/9375	2284/33344	4976/87947

MISCELLANEOUS:	January 1980	Total as of Feb. 1st
TOTAL NUMBER OF TIMES ON	11100	197456
TOTAL HOURS & MINUTES OF USE	4088:51	78199:17
TOTAL PRIV. MESSAGE ADDRESSEES	10707	246942

A usage distribution chart shows how many EIES members accessed the system and for how long. In January 1980, the time period used by most members was between 4 and 8 hours. The breakdown is shows in Table 2, below:

Table 2

EIES Usage Distribution for January 1980

Time Used	No. of Members	Total Time Used	Times On
0	269	—	—
0-15 min.	73	8 hrs. 29 min.	133
15-30 min.	32	11 hrs. 47 min.	114
30-60 min.	62	43 hrs. 30 min.	300
1-2 hrs.	72	101 hrs. 34 min.	551
2-4 hrs.	70	202 hrs. 27 min.	936
4-8 hrs.	75	429 hrs. 4 min.	1,723
8-16 hrs.	56	623 hrs. 38 min.	2,130
16-32 hrs.	27	585 hrs. 16 min.	1,351
32-64 hrs.	25	1,175 hrs. 15 min.	2,303
64-128 hrs.	10	764 hrs. 38 min.	1,443
128-256 hrs.	1	143 hrs. 13 min.	116
256-over, hrs.	0	0	0
	772		

In the group on-line 4 to 8 hours in Table 2, the average time on-line each time was 15 minutes, which is somewhat below the system average. However, at the high end of the scale, those that were on for 32 to 64 hours were on-line 1,175 hours, the average time per access being 31 minutes.

The writer's time on EIES in January 1980, was 5 hours and 31 minutes in 26 times on-line. This averages out at about once-a-day at 13 minutes per terminal session. The report is shown in Table 3 below:

Table 3

EIES User Data for Member #345

	Month of January 1980		Cumulative Total As of February 1st 1980	
	ITEMS/LINES COMPOSED	ITEMS/LINES RECEIVED	ITEMS/LINES COMPOSED	ITEMS/LINES RECEIVED
MESSAGES:				
PRIVATE:	14/188	18/203	146/1246	233/2531
GROUP:	0/0	8/67	10/99	200/2462
CONFERENCES:				
GROUP:	1/10	0/0	2/16	161/3941
PRIVATE:	0/0	0/0	3/52	28/899
PUBLIC:	0/0	0/0	0/0	0/0
NOTEBOOKS:				
GROUP:	0/0	0/0	0/0	0/0
PRIVATE:	0/0	0/0	0/0	0/0
PUBLIC:	0/0	0/0	0/0	0/0

MISCELLANEOUS:

	January 1980	Total as February 1st
TOTAL NUMBER OF TIMES ON	26	248
TOTAL HOURS & MINUTES OF USE	5:31	68: 9
TOTAL PRIV. MESSAGE ADDRESSEES	16	179

REVIEW CHOICE?

2.3.2 Frequency of Use

During the period of this study, records were
kept of those that were on-line every time the
system was accessed. It was from this group of
users that a random sample was taken for those
to be interviewed. There were 31 instances of
accessing the EIES network at various times
during the day and night. The purpose of keeping
this record was to see if there were many users
who were on-line frequently. The occurences
were as shown in Table 4.

Table 4

Number of Times Members were On-Line
in a Sample of 31 Accesses Over Period
January 27 to February 22, 1980

Number of Times On-Line	Number of Members Accessing	Cumulative %
1	96	59
2	37	82
3	13	90
4	7	94
5	2	95
6	4	
7	2	
8	1	
9		
10	2	—
—	164	99½

This indicates that in the 31 times logged on
to EIES, 96 members (or 59%) were encountered
once. At the other extreme, two members were
on 10 times. In order to learn who these
people were, the Directory was accessed for those
who had logged on 4 times or more. These were

10 times – an electronic engineer at a New York Air Force Base;

         – an EIES staff member at the New Jersey Institute of Technology (NJIT);

8 times – an EIES staff member;

7 times – a Defense Communications engineer and amateur radio enthusiast, in Virginia;

         – a pair of communication consultants in Oregon, who assist in the EIES program;

6 times – a staff member of EIES at NJIT;

         – a staff member of EIES at NJIT;

         – the system monitor;

         – a chemistry professor and licenced attorney teaching at NJIT;

5 times – an EIES user consultant in California;

         – a college student majoring in psychology on a research-project related to EIES, at NJIT;

4 times – a doctoral candidate at a Library School in New Jersey;

         – a senior student working under the chemistry/law professor at NJIT;

         – a group at a university disability development center in Vermont;

         – administrator for the POLITECH program on EIES, in Massachusetts;

         – a group of three from a science/communications consulting firm in Rhode Island;

         – a consultant on automobile safety research in Maryland;

         – a monitor on the EIES network in Newark, N. J.

A majority of the heavy users in this sample of
164 EIES members were involved directly with the
System. The balance includes those interested
in electronic communications of one sort or
another, and those seeking knowledge and informa-
tion presumably from others in their field.

2.4 Users' Responses

Thirty people were contacted, either by phone or by
messaging on EIES, who were EIES members. The sample
was chosen at random from the set that had been on-line
during accessing the system in January and February,
1980. Monitors and system staff were excluded. A few
known Canadians were added, and this provided additional
information on why they were members of this U. S.
network. The information sought related to their
use of the system--how, when and how much--and the value
to them in terms of professional contribution, and
business and social contacts. Behavioural responses
and impacts were sought. Respondents did not answer
all questions, so totals do not always add up to the
overall sample size. The following sections show
the results of these interviews.

2.4.1 Use of Computer Terminals

Of the types of computer terminals mentioned in
the survey, the one in most common use by EIES
users is the Texas Instruments Silent 700
portable series, and then the Computer Inc. Devices
Miniterm. The portables were used mostly at
home. Some take the portables on trips. Reactions
to terminals vary from one person who checks the
terminal before going to work each morning, to
another who indicated it was too much like work
to take the terminal home.

One user has two telephone lines at home and two
at work, so that when he is on the terminal it
will not tie up his other telephone communications.
"Having a terminal at home is the sine qua non
of the whole system." Also, "It is an addic-
tive technique to which I have become addicted,
I expect to become even more so in the future."

A count of the location of terminals of EIES
users showed the following:

- have or use only one terminal
  - at the office only   14
  - at the office, but take
    home for evenings and
    week-ends   3
  - use at home only   3
  - use at home, but the
    office _is_ at home
    (consultants)   2
- have (and use) two terminals,
  (one at the office and one at
  home)--one of these has an   9
  additional computer for his
  children   ___

                                          31

- take terminal on trips:
  Yes   10
  No   12

2.4.2 Other Networks and Systems

There were 8 other networks or computer systems
to which various EIES members belonged. THE
SOURCE was mentioned most and was used for general
information and interest purposes. One respondent

found THE SOURCE useful for the UPI news service
and kept up to the minute--ahead of the public
media--during the hostage-taking crisis in
Iran. Another used THE SOURCE as a demonstration
of the existence and potential of such resources.

The other networks and services identified were
usually associated with some particular project.
The networks and services are listed below:

- THE SOURCE   3
- Hermes   1
- Smithsonian Institute private
  network   1
- PLANET
- I. P. Sharp MAILBOX   1
- DEAFNET (Hermes)   1
- Panalog   1
- ARPANET   1

2.4.3   Use of EIES

Questions were asked in this category as to the
use of conferences, messaging, and the amount
of general information gained from various sources
including the weekly news bulletin, CHIMO.

Those that used conferences intensively, were
motivated by a particular projects and used
messaging less and were not inclined to use other
parts of EIES or read CHIMO. Examples were those
who were asked to participate in the design of
rehabilitation equipment for the disabled, and
specialists in general systems theory, each with
their own conference, and a group of specialist
colleagues. A number of EIES members were merely
observing conferences and not actively participa-
ting. One was writing a book, using the notebook
feature of EIES.

In total, more members were active on messaging than in conferences. It is this convivial aspect of the computer communications mode that seems to stand out. The results of the enquiries by type of interest are shown below:

Conferencing and Messaging

Conferencing, find more useful than messaging;	5
Messaging, find more useful than conferencing;	11
Conferencing/messaging about equal;	5

Information Resource

Get useful information on EIES:

- a lot	0
- useful	2
- not much	4
- play a monitoring/ observing role	1

The News Bulletin--CHIMO

- read regularly	2
- read occasionally	9
- do not read	3
- get useful information	2
- follow up leads	2

2.4.4   Accessing the System

The number of times per day and the length of time the EIES network is accessed varies from virtually nil to more than three times a day and for over an hour a day. It should be noted that the use of EIES is for a different purpose than the business communication networks (COCOS or COMET). The former is used by academics or scientists on various research projects working with their colleagues, and the latter is used chiefly for business administration.

In the case of the sample of EIES users, the most frequent user seems to access the terminal three or more times and spend over an hour on it each day. Compared to the active business user, this could hardly be called addiction, but for the researcher it may well be.

The most common use of the system by the respondents in the sample was the use of the terminal once a day, which occupied three to four hours a week. Frequency of use is indicated below:

Frequency of use of terminal

Three times a day or more:	
- with some evenings and weekends	2
Three times a day or more	2
Twice a day	3
Once a day	9
and weekends	2

```
Less than once a day:
    -  2 to 3 times a week          7
    -  once a week                  1
    -  less than once a week        1
```

Time on Terminal

```
More than one hour per day          4

About one hour per day              4

About 3 to 4 hours per week         7
         1 to 2 hours per week      7

About 1 to 2 hours per month        3
```

2.4.5   Problems of Learning to Access and Use EIES

In order to get a sense of the potential public acceptance of this type of communication, the members of the sample group were asked about the degree of frustration or difficulty experienced in learning EIES.

Responses showed that most experienced ",some difficulty" but not major frustration. A number of respondents indicated that they were familiar with computers and terminals and had no difficulty catching on. Enough was learned from those that did have difficulty to realize the importance of simplicity in the system and of having carefully prepared manuals of instruction.

The need for a simpler manual was mentioned more than once. Lack of typing skill was also included as a significant deterrent to effective and continuing use of the terminal. Text-editing should be simplified, was another comment.

Future growth, it was noted, would be dependent on simplifying the system.

Responses showed:

- easy to learn, no real
  problems   9
- some difficulties   11
- difficult, frustrating   4

2.4.6 The Professional Value

In response to the question of how members saw its professional value, most people found it useful while many found it quite, or very, useful. Only a few found it not useful.

Once user noted the increased visibility that access to a community of professional colleagues gave him. It was a way of keeping up-to-date in the discipline, and provided access to people not otherwise available. Another noted that the use of the telephone was down, and his work time was used more effectively.

Responses showed:

Professional Value

- high   10
- medium   13
- low   2

Professional contacts

- very good   7
- good   9
- low   5

Among responses regarding professional contacts
one respondent noted that it is possible to
experience "intense relationships" in this
medium.

Other comments included,

- it widens scope of contacts,
- it inhibits other social life.

2.4.7 Travel

On the subject of the impact of EIES on travel,
most said it tends to reduce travel but a few
said it increased travel. The increases of
travel were attributed to making new contacts
and seeking them out for either social or
professional reasons.

The need for holding meetings is reduced and
consequently travel is saved. One said it makes
travel more profitable.

Responses indicated:

- some increases because of
  CCM   3
- no effect on travel   5
- tends to reduce travel   6
- has actually reduced travel   6

2.4.8 Impact of Terminal at Home on the Family

In most cases, there was no impact on family
relations by having and using a terminal at home.
However, there was a strong leaning towards
negative impact because of bringing home business
that was felt by the family to be an intrusion
on their time together. Some responses indicated

that there was stress at first but the family adjusted. In one case, the adjustment was easier because the teenagers in the family had a computer of their own.

Responses showed impact on family as:

- negative effect   3
- family adjusts   4
- no effect, no problems   8
- young people have own computer   2
- live alone, not applicable   5

2.4.9 The Future of Computer Conferencing and Computer Messaging

No one said the that the future of CCM was low; nine said fair, and thirteen said it had high growth potential. This relationship might be expected since users are generally the best supporters. First, consider the constraints to growth that were mentioned by respondents:

- cost will be greatest constraint,
- tremendous interest, but accompanied by anxiety, fear and apprehensions,
- needs simplification and better text editing,
- institutional arrangements need to be worked out,
- at home, or at work, two telephones are needed.

On the positive side, respondents said:

- future growth compares to the telephone,
- others in business will not be able to catch up,
- "that is the future for professionals"

- high potential in social and community
  communications,
- with cities becoming dangerous, travel
  will be cut down to advantage.

And, on what should be done to improve the
development of the process, respondents commented:

- composing off-line and sending at
  high speed,
- use of cable and satellite rather than
  phone lines,
- international connections would
  improve usefulness,
- communications combined with notebook,
  word processing and graphics,
- a professor wants graphics and the
  equivalent of a blackboard (which is
  how he communicates),
- Telidon*, with interactive communica-
  ting has great potential,
- text translation facility (to other
  languages) would be useful.

In summary, the respondents felt that the growth
potential of computer communications was:

- high, very good   13
- fair, medium   9
- low   0

In the next section the CCM networks in the
business community are dealt with as a group,
and the other networks are discussed separately
because of their individual differences.

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* Telidon is a Canadian development which permits a viewer
  who owns a converter terminal to obtain computer-stored
  information of both text and colour graphics. The infor-
  mation is displayed on his home TV and is delivered to
  him over telephone lines, cable TV or via broadcast
  along with the television signal.

3   FINDINGS: THE BUSINESS COMMUNITY

Of the twenty-three CCM networks identified and contacted
there were twelve in organizations that used a form of
message sending to manage the business affairs of the
company. These will be dealt with as a group in this section
of the paper. Descriptions of the extent and nature of these
networks for each individual organization are provided for
reference purposes in Appendix 3. In this group of 12
organizations the size of the network in terms of people
at terminals varied from 25 to 2,000. Several had interna-
tional connections which included the U. S. A., Canada,
countries in Europe, and Australia. In all cases, the
companies were in the computer/communications business,
providing services to clients, or manufacturing related
equipment.

The purpose of the communications system using terminals and
a host computer was in each case to administer the day-to-day
affairs. Some had terminals with keyboard and CRT on their
desks or within reach, others dealt through their support
staff. Most respondents accessed the terminal three to
four times a day and occasionally took a portable home on
the weekends. A large organization with an active system
reported the average manager sent and received 20 to 40
messages a day, phone calls were reduced from the traditional
way of doing business, and paper flow was down considerably.
In fact, it was reported that there was a direct correlation
between declining volume of paper mail flow and increasing
volume of electronic message sending.

New work patterns were suggested by one company manager in
the manager/secretary relationship. He often initiated
announcements of meetings, his secretary would notice the
message on her terminal and do the necessary follow-up. He
would see her follow-up when he accessed his terminal, and
note who had responded, and be aware of who would be coming
to the meeting. In this way, they operated more as a team
and less in a boss-subordinate relationship.

Many managers and executives had terminals at home--portables
or micros--and accessed the network several times over the
weekend. One respondent suggested that the prestige element
for executives now was marked by portable terminals rather
than by secretaries.

A caution was voiced by one user in a large computer equipment
company who used the computer message system regularly. He
found that there was a distinct possibility of information
overload. This possibility was mentioned by only one user,
which in itself is remarkable in view of its strong likeli-
hood. Growth of these systems of computer messaging for
business administration was indicated by one company repre-
sentative who reported that sales of their message system
to business clients had increased an average of 11% per
month since it was begun approximately two years ago. A
second large user reported that the use of the system for
internal company administration was growing at 5% a month;
a "critical mass" of users was now established and managers
could no longer afford to not be on the network.

4   FINDINGS: OTHER CCM NETWORKS

Outside of EIES and the business community, there were 10
other other networks identified and personnel in these
systems were contacted. Four of these were in government,
or related to government agencies, and the balance social,
specialized or hobby. Each of these is dealt with separately,
and then the effectivensss is discussed at the end of the
section.

4.1 Government

4.1.1 Shirley's Bay Research Centre, Department of Communications, Ottawa, Canada

A small network of computer communications has been operating for four years averaging about 10 messages a day among about 12 regional technical staff members across Canada and five at headquarters in Ottawa. They find this means of communicating convenient for exchanging information on computer problems and on assignment of radio frequencies. The system has conferencing and information retrieval capability but these particular features of the communications system were tried for a period of time and were found not to be popular and fell into disuse. The messaging functions are still in continuing use.

4.1.2 Non-Medical Use of Drugs (NMUD), Department of Health and Welfare, Ottawa, Canada

A full conferencing, information bank and messaging system was implemented in the NMUD Directorate in 1974 and ran until December 1977. It was shut down because of the high cost to the Directorate and the lack of a real purpose or need. There were 45 listed members across Canada of which 15 or 20 were active. The information bank was built up by the Directorate librarian with identification and extracts of journal and media articles on the non-medical use of drugs.

The NMUD computer conferencing experience has been described and analyzed by R. H. Irving in his paper "Computer Assisted Communication in a Directorate of the Canadian Federal Government-- A Pilot Study"[4].

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4 From "Evaluating New Telecommunications Services", Elton, Lucas and Conrath; Plenum Press, New York, N. Y.; 1978.

4.1.3 Centre for Geoscience Data, Department of Energy, Mines & Resources, Ottawa, Canada

This group tried, two years ago, two systems of computer conferencing and messaging--PLANET[5] with full conferencing and messaging capability, and COMET[6], with only a messaging facility. Sufficient use was not made of the services to justify their expense and each in turn was dropped.

The Centre attempted to get a provincial/federal network started to use computer conferencing and/ or messaging, and provided rented terminals (T. I. 700 series) for each provincial office involved. The cost of terminals for each of the provinces, plus the cost of their computer time, was borne by the Centre to support the experiment. The cost was found to be too great to continue and the program was discontinued.

The Geosciences Centre participated in a computer conference trial operated on PLANET by the Institute for the Future in the period from May 1973 to December 1976. The network involved 141 geologists in a number of countries. One test included 11 experts in five countries debating the questions of mineral information standards for two hours on an international computer network. The system was also used to prepare and follow-up two workshops and a major meeting in Paris, France. A paper is available describing and analyzing in detail these computer conference trials.[7]

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5 A product of Infomedia, Inc.; Palo Alto, California.

6 A product of Computer Corporation of America, Cambridge, Massachusetts.

7 Askevold, Vallee, Wilson, "Computer Conferencing in the Geosciences", Institute for the Future, Menlo Park, California, 94025, May 1977. Special report SR-78.

4.1.4 SAM's CLUB[8]

SAM's CLUB is the acronym for a computer confer-
ence applied to the managing of the international
Aquatic Sciences & Fisheries Information System
(ASFIS) begun in January 1978. Features of the
conference are given in the paper by Freeman
and Heyworth.

> "Members of a computer conference may
> exchange messages in unstructured note
> form, hold seminars or meetings,
> develop jointly-authored reports, and
> elicit information in questionnaire
> style. The style of communication may
> be collegial, or there may be definite
> pre-assigned roles to participants,
> such as critic, reviewer, editor, or
> expert..."

A typical session by a user takes 20 to 30
minutes and includes signing on, receiving and
sending messages. This is done once every day
or two. From December 1977 to January 1979,
over 800 messages were exchanged. The network
includes representatives in Canada, the U. S.,
Mexico, Portugal, France, and the U. K. There
are 20 members of which 15 are currently active.

Janice Heyworth, of the Water Resource Document
Reference Centre, Environment Canada, reports
successful use of the conferencing medium to
conduct the affairs of the organization. The
costs of operation are picked up by the U. S.
Environmental Science Information Center and are
estimated to run, with Telenet charges, at
about $13 per connect hour.

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8 As reported by Robert Freeman of the Environmental Science
Center, Rockville, Maryland, and Janice Heyworth of Inland
Waters Directorate, Department of Fisheries & Environment,
Ottawa, in "SAM's CLUB: Computer Conferencing as a Tool
for the Management of an International Information System".

Travel is not reduced, but at the annual board meetings the level of discussion is raised by virtue of preliminary discussion of the agenda by computer conferencing.

The value of this mode of communication consists not only in speeding answers, but in encouraging discussion which would not be likely by other more traditional means.

Of the five computer conferencing systems in the four government agencies, one was discontinued because of costs, and one from a combination of cost and lack of real purpose. Three of the systems were successful, although one has dropped the conferencing facility and retained the messaging function. The two that were most effective served an international role in organizing group meetings for the agencies concerned.

In considering these five systems then, cost is a deterrent to the continuity of computer conferencing unless the purpose and pay-off is sufficiently strong.

4.2 Social, Specialized or Hobby Networks

4.2.1 THE SOURCE

THE SOURCE is a computer service company in Maclean, Virginia that provides a wide range of programs to the private or company subscriber. It has a unique rate structure--an initiation fee of $100 and $15 per hour for prime-time usage and $2.75 per hour for use between 6 p.m. and 7 a.m. To this must be added the line service of Telenet accessed in Canada through Datapac ($4.00 per hour). They originally aimed

their services at the individual user, which type
of subscriber now comprises 65% of their business.
Now they are marketing in the commercial sector.
They report 6,000 users at present with new
accounts being signed up at the rate of 600 to
700 per week. Services available at these
rates include access to data bases and programs
such as:

> New York Times, reference and daily summary
> U.P.I. News Service
> Journal abstracts
> Travel information
> Financial programs
> Accounting packages
> Electronic Mail
> Personal notebooks and calendars
> Directory of users, with search capability
> Dining out (by geographic areas)
> Classified ads
> Education programs
> Games.

The staff member contacted by phone said he uses
the terminal in his office three or four times
a day, and at home in evenings and weekends and
while on travel. His sone uses his home terminal
for games. He notes that people use the directory
in the system to find "pen pals" by geographic
area, and he knows of romances started by those
electronic correspondents and continued on THE
SOURCE!

A description of THE SOURCE is in Interface Age,
January 1980, where they say that "its greatest
impact is for sending fun messages between
users".

4.2.2   The Community Memory

Community Memory was an experiment in community
communications where terminals (with CRT and
print-out) were placed in stores, libraries,
community centres, available to anyone in the
community. A series of 10 to 20 terminals were
connected to a small computer with a large
memory, and the local network was comrpised of
several of these sets of terminals-and-computer
interconnected. Users input messages or want-ads
or meeting notices or initiated discussions--
particularly on local issues. There was no
formal structure or any advance input to memory.
It was directed from Berkley, California but the
initial experiments were in San Franscisco and
Vancouver. The Community Memory was advertised
by poster, personal contact, local paper mention
and flyers, but, there was no organized advert-
ising or promotion. This was in order to
maintain the low key self-determination style
of the project. The terminals were in use 70%
of the available time. It was found that the
public could use an electronic information exchange
system without prior training to define and meet
its information needs.

At present, the system is inoperative due to a
shortage of financing but the voluntary organiza-
tion that runs it is still active and engaged
in searching for financial support. Literature
is available (see Appendix 4).

4.2.3   DEAFNET

This is a computer messaging and news service
operating out of Boston for deaf people. It is
financed by the U. S. Department of Health,
Education and Welfare and facilitated by ARPANET,

the U. S. Department of Defense computer network
and uses the HERMES software package. 40 to 50
people are on the system which is one of several
similar systems in the U. S.

4.2.4   The Family Network

One example was found of a computer messaging
system set up to facilitate family communications.
The network, initiated by the father in Ottawa,
included members of the family in St. John's,
Newfoundland; Waterloo, Ontario; and Victoria,
B. C. The medium was the MAILBOX system of
I. P. Sharp Associates and the equipment was the
father's home computer-terminal TRS-80 with
modem; with other members of the family acces-
sing terminals in nearby universities. The
results were not as fruitful as had been hoped,
because of the difficulty of accessing terminals
which were inconveniently located.

4.2.5   Community Bulletin Board Systems (CBBS)

There is a series of 50 or more Community Bulletin
Board Systems throught the U. S. and Canada.
Each CBBS is similar to the one set up in
February 1978 by Ward Christensen and Randy Suess
is Chicago.[9] William Adney, of Kansas City, is
said to be the originator of these concepts and
systems. The purpose of each separate network
is to provide a local message service for computer
hobbyists, who want to exchange information on
hardware and software and other information rele-
vant to their particular hobby. A network is
comprised of the home computer terminals of

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9   See BYTE--November, 1978, p. 150 to 157.

hobbyists connected through the telelphone
system via modems to a computer provided by one
of the members of the group as the host for the
messaging. The Chicago network currently has
50 to 100 active members and there are from 30
to 50 messages handled in a day, 8 to 10 of which
are first time users. Current message numbers
are in the 25,000's, numbered consecutively
from the start two years ago.

A similar Bulletin Board was started December 1,
1979, in Vancouver, using the computer program
developed by the Chicago pair. There are
currently 40 to 50 members; about half that
number are active; the system handles eight to
ten messages per week.

Contact with the CBBS in Princeton, N. J.
indicated that the host computer has, until
recently, been a Radio Shack TRS-80 with two
disks and 48K memory. It began in August 1979
and ran until February 23, 1980. About 2,000
messages were logged and about 25 people were
daily users of the service. It is now being
moved to different quarters and the programming
upgraded. The new programming will permit access
by computers other than TRS-80, and enlarge the
scope of the messaging to include personal,
general, commercial sales and experimental
categories. The programs now being developed
for such networking are called "Forum-80" and
were designed and now marketed by William
Adney of Kansas City.

A list of CBBS local networks, as provided in
the CHIMO newsletter, is shown in Appendix 5.
Anyone can access these local bulletin boards
by dialing the phone number (long distance!)
as shown on the list, and connecting to one's

own terminal with modem. A couple of carriage
returns activates the program, and instructions
are then provided.

4.2.6   Radio-Packet

A radio-packet network is where hobby
computers send their messages over shortwave
telephone or satellite connections. One
has recently (February 1980) commenced
operation in Montreal, with about 15
participants. The host computer is provided
by individuals or by the group as a whole.
Ottawa will have a similar system operating
early this summer (1980). It is reported
that there are 200 hobbyists in the Ottawa
area who have the necessary equipment to
participate in such a communication system.
It is too early to say how the system will
be used but it is safe to say it will at
least start off in a similar manner to the
Community Bulletin Board System, serving
the technological interests of the hobbyists.

In the six social, specialized and hobby networks, two have
virtually ceased, and the other four appear to be prospering.
The reason for the closing of the two networks was lack of
funds in the one case and lack of convenient terminals in
the other. For the four prospering systems, one is special-
ized and has high motivation and financial support, and the
other three are users with high hobby interest and motiva-
tion. There is, undoubtedly, a market ceiling for the pure
hobby networks--like CBBS and radio-packet--but not for
services like THE SOURCE. THE SOURCE, with 6,000 subscribers
reportedly, and increasing at 600 or 10% per week, suggests
a future for this type of CCM system that has interesting
market potential.

PART IV

ANALYSIS AND ASSESSMENT

ANALYSIS AND ASSESSMENT

1 INTRODUCTION

This section will point out some of the differences between conferencing and messaging and then will discuss the various computer communicating systems in terms of six criteria for successful computer conferencing. It will then look at the patterns of use or behavioural aspects of these systems from the users' point of view. Finally, there will be an outline of potential uses and problems arising from the study of these 23 CCM systems.

It has been pointed out by Turoff[10] that conferencing and messaging are very different sorts of communication. The way the system is set-up in EIES would indicate that these two types of communicating are indeed different. Conferencing on EIES is a process of addressing a group where the partici-pant inputs views, opinions, reactions and information on a topic and often in response to another member's prior comment. In a varied community of members like EIES, some members do not take to this kind of interchange, and act as observers of conferences and use the message system more frequently. Although the system statistics show about an equal activity between conferencing and messaging, the survey of individual members of EIES shows a preference for messaging.

It is possible that some people do not feel comfortable responding to conference comments, because it is difficult to be spontaneously articulate. For them, the direct response required of messaging is much less demanding. This constraint to instant response in the conferencing process was pointed out and partially explained by Chapanis[11] in a series of

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10 Murray Turoff, "The EIES Experience", Bulletin of the American Society for Information Science, Vol. 4, No. 5; June 1978.

11 Alphonse Chapanis, "Interactive Human Communication", Scientific American, March 1975.

laboratory experiments on communication reported in Scientific American:

> "Second, the kind of typing called for in interactive communication is unusual. Typing skill is normally measured by having subjects copy text material. In communication by typewriter, however, the communicator has to decide what to say, compose his thoughts into a message (often fragmented and incomplete) and then type out the message. The transmissions are characterized by hesitations, mistakes, changes of thought and irregular tempos that may at various times be indirect expressions of doubt, amusement or anger. In short, typing skill is usually measured as a strictly mechanical or psychomotor activity, whereas communication by teletypewriter is a much more intellectual process."

These findings of Chapanis also support the need in a CCM system, for easy text editing. Typing ideas onto paper or into a terminal is not easy for many people, and the facility to make corrections simply, before committing to delivery, is an important one.

Recognizing the differences between conferencing and messaging in this way helps to understand why some means of communicating are more successful than others.

2 CRITERIA FOR SUCCESSFUL CONFERENCING

Based on the work of Hiltz and Turoff (see reference 2, page 119) a set of six criteria was developed for successful conferencing; these apply to a great extent to messaging also.

These are:

1. convenient terminal access,
2. a degree of motivation, purpose or pay-off,
3. effective training procedures, to minimize frustration,
4. competent leadership,

5. a "critical mass" of participants, in number
   and in location,
6. reasonable cost.

2.1 Terminal Access

In most of the CCM systems included in this study,
terminal access was easy and convenient. In many of
the businesses contacted, the managers--and often their
secretaries--had terminals on their desks, or within
reach. In some cases, the manager wrote a note by
hand, gave it to his support staff who then transmitted
it. In some cases, the infrequency of use, yet the
importance of the communication, did not require a
terminal on the desk--or in the same room--for the
system to be useful and effective (e.g. SAM's CLUB,
Geoscience Centre). In the case of the family network,
the inaccessibility of terminals was the obvious cause
of its lack of participation. Where motivation is light
(e.g. social interchange) a convenient terminal is
essential to active participation. Also, where distrac-
tions and demands on time are high--as in a business
administration environment--the terminal must be easily
accessible to be at all useful. Many networks are
accessed frequently because terminals are available
at home. One respondent noted that for terminals to be
used more by executives on travel, it will be necessary
to reduce the weight of todays' portable by a consider-
able amount. In the case of EIES, the sponsor National
Science Foundation, often provided the terminal at no
cost to the user in order to ensure participation in
the project. Thus, a variety of levels of accessibility
of terminals exist for the different systems in the
survey, but for most users of CCM the terminal must be
easily accessible.

2.2 Motivation

The motivation or pay-off varies widely from one system to another. In EIES, a frequent source of motivation is the topic and purpose of the conference and its relation to the participants' daily work. For example, a conference on Devices for the Disabled was comprised of professionals throughout North America who were working on this subject and benefited from communicating with colleagues in the field. In the business community, the success of the messaging system was relevant to the "critical mass" on the system. Motivation was provided by the loss incurred by not being on the system and missing information. Motivation in the NMUD conferencing system was low because there was no real purpose being served, no one needed the information and interchange that was available.

Motivation and pay-off are clearly fundamental to the success of computer conferencing and messaging.

2.3 Learning

Ability to use the system without undue frustration is important in communicating by computer. A number of people had problems of learning and using EIES, and several suggested a simplified instruction manual. Inability to type was pointed out as an inhibitor of communicating by computer terminal.

Some people would not be frequent users of the conferencing system because, as pointed out above, they are not comfortable composing and typing an immediate response to a conference and addressing it to a group. Text editing, off-line, would be a facilitator for participation by these people.

Much of the frustration people presently experience with communicating by computer can be eliminated or reduced significantly in the initial design and

and programming. Subsequent training is also a great help in using CCM systems to their full potential.

2.4 Leadership

The importance of good leadership applies to the conferencing procedure more than to simple one-to-one messaging. Conferences can move slowly or fail if participants are not monitored and encouraged, and the standard functions of group leadership and meeting chairing provided. It will be noted that EIES has been particularly thorough in this regard.

2.5 Critical Mass

The critical mass as a success criterion was noticed most in the messaging systems observed in the business community. Too low a usage and participation level does not create a demand to be on the system. Probably 1/3 of the managers and executives would constitute a critical mass. In the case of conferencing on EIES and other networks, there must be a sufficient number of participants to provide the action so that the few who are not active will not cause it to lag and die. Usually, this is 20 or more. Critical mass should be carefully considered in designing and planning for a proposed computer conference.

2.6 Cost

Cost is one of the most critical factors in the successful continuity of a computer conferencing and messaging system. In the case of EIES, financial support was provided by the National Science Foundation. This ends April 1, 1980. How it will fare by support from user fees from then on has yet to be determined. In the business sector, the companies in the survey were in the computer/communications business so costs to

them had a different meaning. In many of them, the
systems for communicating were already in place having
been installed for other related services.

Sales increases of 11% per month reported by the company
marketing business messaging systems suggests that
costs are manageable in relation to benefits gained.
In the case of the Community Memory project, costs
were the barrier and the project was shut down.

It is interesting to note that THE SOURCE is increasing
individual subscriptions at the rate of 600 per week,
and current attempts at logging on are frequently met
with "all ports busy". Cost of THE SOURCE at $2.75
per hour (non-prime time) plus Telenet at $3.50 in the
U.S. and $6.50 in Canada, is apparently reasonable enough
to attract a great number of new users. In computer
conferencing for the affairs of international groups,
as is the case in three of the networks identified in
this survey, cost would not likely be the major factor.

Costs for an individual to have a computer messaging
facility at home would be about $2,000 for a TRS-80
or PET which would provide keyboard, computer/terminal,
video screen and an accoustic coupler to the telephone
(modem). To add a printer of the dot matrix variety
would cost another $1,500 to $2,000, including interface
connections. For a business to have the computer com-
munications facility the usual way is with a desktop
terminal/printer (no videoscreen) and coupler to the
telephone line. Terminal/printer costs start at about
$1,700 plus coupler at $400.

For use in travel the portable terminal in most common
use by EIES members is the TI745 which costs about
$2,500 to buy and $185 a month to rent. This has a
keyboard and printer much like a small portable
typewriter with an accoustic coupler attached.

When Telidon is in common use it is very likely that
new technology will create innovative products that

will substantially reduce the above costs.

Cost of on-line time varies from $10 per hour to $50 for communicating, but runs up to $90 per hour for accessing certain proprietary data banks. THE SOURCE, for example, would cost a Canadian about $10 per hour for on-line communications and information retrieval.

Among the six criteria of successful CCM systems there is a lot of interdependence, but cost seems to be one of the most constraining factors. This suggests that once the costs of the various aspects reach a lower and critical level, barriers to entry will be removed, new applications will be found, and increasing growth rates experienced in these services.

3 PATTERNS OF USE

From the information obtained from over 50 people interviewed during this study, a number of use patterns emerged.

3.1 Addiction

In the academic and professional community (on the EIES network) there was a wide range in frequency and time of use in accessing the computer terminal. The average use was once a day which amounted to being on the terminal two to three hours a week. This did not seem to create any distinct use pattern, but among some of the heavy users of the EIES network there were some behavioural manifestations. In conference 213 there was a discussion of the addictive effect of computer communications. A list was proposed of seven criteria of addiction:

1. signing on at least several times a
   day ("maybe something is waiting"),
2. physical signs (of frustration and

exasperation) when the system is
inaccessible,

3. inability to compose off line,

4. inability to think off line,

5. inability or lack of desire to conduct
collegial relationships off line,

6. inability to sleep without signing on
one last time,

7. dreaming about EIES.

Interestingly enough several people responded to this
proposed list of addiction criteria, and claimed some
of these symptoms. One member of EIES responded with
his interpretation of why the medium can be addictive:

> "Maybe EIES is particularly addictive, at least
> for some people, because it provides a place
> to "brainstorm" informally on many thought-
> provoking topics that don't often come up
> at most social gatherings. Also, the
> opportunity to have contact with people you
> would normally not meet, due to professional
> and geographic distance; thus the spectrum
> of ideas is much broader than within a close
> circle of friends/colleagues. EIES can
> be addicting simply as a source of information,
> particularly for those who crave information."

3.2 Work-Style

In the business community some changes in work-style,
because of the computer messaging system being used
were observed. Meetings were arranged and agenda
prepared more effectively, crises resolved more
quickly and consensus on issues more readily obtained.
In one case, the manager-secretary relationship appeared
to have a team orientation rather than the traditional
boss-employee one. Both the manager and secretary
had terminals on their desks and many jobs were done
co-operatively. A number of managers reported using
the terminals evenings and week-ends and on trips. A

computer service company that sells a computer conferencing system to business clients noted that 50% of their client connect time was on week-ends. Travel to meetings has, in some applications of computer conferencing, been reduced or eliminated. In other cases, the effectiveness of travel has been increased by the preparation made possible through computer conferencing.

3.3 Impact in the Home

Because of evening and week-end work that is now done on the computer terminal there is a change for some families in life-style at home. One executive accesses the terminal at breakfast time, to check on messages before he goes to work in the morning, and two or three times over the week-end. This feature of the terminal invites frequent access, but poses a threat to some families by cutting into their time together. Some users of terminals at home saw the need for two terminals and perhaps two or more personal accounts on the networks. This could be compared to the telephone and the TV set in the home, where many families have more than one.

4 POTENTIAL USES AND PROBLEMS

4.1 Conferencing

Successful computer conferencing has been demonstrated over a wide range of applications. To list a few:

- designing devices for the disabled,
- planning and organizing international conferences and meetings,
- conducting the affairs of an international technical association,
- providing resource material for setting up new legislation, exchanging information between legislative staffs,

- co-authoring papers and writing books.

Computer conferencing is a unique method of communicating that has yet to be fully explored. It provides a means of group interaction to exchange information, just as information for each individual in the group, or to contribute to the advancement of a project, or the group resolution of a problem. The experimental work of EIES in setting up and operating a variety of computer conferencing trials has made a significant contribution to the communications and information field. Canadians have been fortunate in being able to participate in these experiences. Potential uses of this mode of information exchange are great in fields such as education, legislation, federal-provincial interchanges, research projects, community communications, discussion of public issues, and many other areas. The social benefits of the group interaction that is possible by computer-type information exchanges, has interesting and high potential. Some specific suggestions of the types of projects that could benefit from computer conferencing are:

- exchange of information, experiences and
  directions in the handling of grievances
  in labour relations in a multi-plant, multi-
  union company or organization;

- exploration of scientific and research
  problems in a large organization, or among
  a number of smaller ones;

- provincial interchange of information on
  technical matters of interest, for example,
  environmental standards and regulations
  (similar to LEGITECH);

- social interchange in a community discussing
  timely issues of common interest;

- inter-provincial educational problems and
  issues of common concern;

- dialoguing with citizens on federal issues
  of strong interest, a kind of federal
  government/citizen interchange.

The problems that inhibit successful conferencing have
been set out in descriptions of the six criteria
previously noted. The potential uses are large indeed,
as demonstrated by over 50 individual conferences
on EIES and several others identified in the survey.
Support and experiments in new computer conferencing
applications will probably come from government or
academia, and this may well be limited until the costs
of operating such conferences come down sufficiently.

4.2 Messaging

One of the most active uses of the computer messaging
system at present is for business administration.
This will be an important potential growth area.

Another market that also has high growth potential--
perhaps the greatest potential--is the personal
messaging market. It is already growing rapidly in
both the activity of messaging (n.b. THE SOURCE) and
in the development of the infrastructure, the purchase
of home computers with communications potential or
capability. Again, it will be important here to be
aware of the criteria for successful conferencing and
messaging in the development of these potential
markets.

The ultimate in the development of the messaging market
will be the ability to send a message to anyone anywhere
knowing only the computer address of the addressee
(e.g., social insurance number) and that the addressee
will access a terminal periodically (from any location)
to pick up the message. This already exists, of course,

in a limited way for those who are members of existing
computer messaging systems. By providing every Canadian
citizen with the facility to have a personal code
number (like a social insurance number) which would be
an account number and a computer address, universal
computer mail could be established. Whether such a
program would be set up as a government public utility,
or developed and operated by private enterprise--as
already begun--would be a decision for the Government
of Canada to make.

A potential of computer communications that has not been
mentioned is the entrepreneurial exploitation of the field.
Information services of one kind or another can be marketed
from any location with telephone access. An individual can,
from a remote geographic location, offer education courses,
consulting services, specialized data banks, or an infinite
variety of information services and "commodities". Such
services could even be generated from a hospital bed, or
a prison cell, or from a portable terminal while on travel.
If the "barriers to entry" to this kind of entrepreneurial
opportunity are kept low and flexible, the economic growth
of the Information Society will have significant potential.
Gordon Thompson points this out in "Memo from Mercury" saying
that the new wealth generated by the Information Society
will, to a large extent, supplant that being lost in the
production of material goods.[12]

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12 Thompson, Gordon B., "Memo from Mercury", Institute for
    Research in Public Policy, Montreal, 1979.

PART V

SUMMARY OBSERVATIONS

SUMMARY OBSERVATIONS

1 CONFERENCING

It is clear from the work undertaken that there is a wide
variety of systems and networks operating on this continent
for computer conferencing and messaging. The survey was an
exploratory one and represents only a partial coverage of
the total activity. Nevertheless, a number of interesting
and useful observations can be drawn from the interviews with
over 50 users of these various systems.

Some unique applications of conferencing were found, e.g.,
DEAFNET, Devices for Disabled and LEGITECH (conference on
State Government legislation) which suggests that growth
potential exists if exploration and innovations are supported
and encouraged. Participants of the Electronic Information
Exchange System access terminals, on an average, once a day,
consuming two to three hours per week. Some users get to
the point of addiction, accessing the terminal several times
a day and once before going to bed--"to see if there are any
messages". Such use of the terminal at home has, for some
families, a recognized stress potential.

2 COMPUTER MESSAGING

In the computer messaging activity, a number of companies
are using these systems to conduct their day-to-day business
on a world scale. Work styles are being changed by computer
messaging--the boss/secretary relationship was observed in
one instance to be more team oriented, paper work and phone
calls are down in some companies, and in many, business is
conducted day, night and weekends on the computer terminal.
Growth in the use of these systems is reported by two large
users as 11% per month and 5% per month.

There is one computer utility that may well be the sign of
the times. It sells to individual subscribers a variety of
information retrieval services, and a messaging system.
Growth presently is at the rate of 10% per week and their
greatest problem is getting enough equipment to keep up
with demand.

The power of messaging seems to be strong. Members of EIES
THE SOURCE, and the business community use computer communica-
ting more for messaging than for conferencing; in other
words, the convivial and perhaps functional aspects of messaging
must, on the whole, be more demanding and have higher
motivation and pay-off than the other services.

3 THREE MOST ACTIVE CRITERIA

Based on the findings of the survey, the three most important
criteria necessary to maintain successful computer conferen-
cing and messaging are:

1. low cost,
2. a useful purpose,
3. easy access to a computer terminal.

Whether cost or purpose is the prime criterion varies with
the individual situation.

4 THE FUTURE

The future of computer conferencing and messaging would seem
to have considerable promise, particularly as the awareness
of its potential increases and as costs of equipment and
operation come down. A number of new applications can be
visualized:

- a universal computer messaging service,
- messaging using TV, cable, satellite,
- use of computer conferencing for handling
  grievances, administering projects, exploring
  research problems, exchanging information on
  proposed legislation and regulations between
  provinces, discussion of community issues,
  government-to-citizen dialogues.

A number of the findings of the survey are incorporated in
the brief scenario of the future--the near future--that
follows and concludes this study.

A Scenario of the Near Future

The scene: an evening at home with father, mother, and
              the sub-teenager

Junior is in his room using his computer terminal, with CRT
and printer, to access information to help write an essay.
He will type it out on the text editor and produce hard
copy on the printer. He anticipates that the project will
take into the following morning, so he sends a computer
message to the school and his friend up the street that he
will not be going to school until mid-morning.

Father is in the den--his second office--communicating on
the terminal with his overseas representative, clearing up
some electronic files and leaving messages for his staff
for the morning. Later, he will check the data bank for the
latest financial and other news of particular interest to
him.

Mother is relaxing because she has spent a good half day
already on the terminal in the den. She works part time at
home each weekday for a publisher in a nearby city and has
been reviewing manuscripts and communicating with her
office, and directly with business contacts via the terminal.

Each manages their own finances in running the home and
paying for computer time--even Junior. He has a small income
from marking lower-grade test papers on the terminal and
thus pays for his own computer costs. The family is not
surprised at computer bills of $100 to $200 a month each for
personal connect time. Time logged in on business is, of
course, billed to and paid for by the employer.

Phone bills are down, very little mail is received via the
Post Office, bills are paid and cheque books balanced on the
terminal. Very little use is made of TV, except for special
programs announced on their terminal daily news--each person
getting their own news briefs.

When the family travels, individually or together, a terminal
is taken along to keep up to date with friends, keep a trip
diary and, perhaps, to check in at the office as the occasion
demands. The terminal is their window on the world.

Appendix 1

Electronic Information Exchange System

EIES Fact Sheets

EIES FACT SHEET #1
AN OVERVIEW OF EIES AND ITS USERS

The Electronic Information Exchange System (EIES) at the New
Jersey Institute of Technology is a computer based
communications system which links together 700 people all over
North America and in Europe. It is an organized communication
space which provides various structures for the exchange of
information. Users may send and receive messages, engage in
electronic conferences or "meetings", jointly draft articles and
reports, contribute to and read computer-based "journals", and
design computer aids tailored to their own work.

Users say the system organizes their time better because they
can send and pick up messages at their convenience. They can
introduce themselves to and communicate with dozens more people
than they could otherwise, and they can sift easily through
masses of data on complex issues like energy or waste disposal.
On-line researchers studying how people use EIES help others
understand and develop the protocols of message-sending, and
EIES users provide the necessary data for NJIT's research into
this new form of human communication.

EIES USERS

The variety of activities carried out by the members of EIES
sounds like a modern "Twelve Days of Christmas". There is one
child who plays a computer based game of "Hangman". Ten experts
on viral hepatitis are jointly compiling a data base on
everything that is known about the diagnosis and treatment of
the disease. Fourteen authors are jointly writing an article on
"superliteracy" for OMNI magazine. About two dozen "futurists"
are discussing the potential sources of energy in the future and
the impact which reliance upon them would have on American
society. Twenty five state legislative science advisors are
exchanging inquiries and responses related to possible new state
legislation.

The Electronic Information Exchange System has been likened to a
"blooming buzzing garden" by its designer, Dr. Murray Turoff,
where over 700 members in over fifty groups are working on
cooperative projects. With the computer used to store and
organize their communications, they are able to carry out a
variety of projects despite the fact that they are located all
over North America and Europe. EIES is available for
participation by any group interested in exploring this new
technology, at a cost of $66 a month for a membership in the
system.

Among the groups which have previously used or are currently
using EIES are the following (an asterisk (*) indicates that a
fact sheet is available on the particular application; write to
the address below to obtain the fact sheets in which you are
interested).

LIST OF EIES FACT SHEETS

The Electronic Information Exchange System (EIES) at the Computerized Conferencing and Communications Center (CCCC) on the campus of the New Jersey Institute of Technology (NJIT) is dedicated to exploring the use of computers to facilitate human communication. The system has been operative since 1976 and has logged many thousands of hours of user experience in an environment dedicated to the evaluation and development of this new form of human communication. The following one page fact sheets have been prepared to introduce people to the nature and scope of this research and development effort.

TITLE	#	CHECK
EIES OVERVIEW	1	----
. Nature of System and Users		
EIES ECONOMICS AND TECHNOLOGY	2	----
. Costs of use, hardware and software		
EIES AS A HUMAN SYSTEM O	3	----
. Humanization of a computer system		
APPLICATIONS FOR MEETING AND CONFERENCE PLANNING	4	----
. White House Conference on Libraries and Information Services		
APPLICATIONS FOR DEVELOPING STANDARDS	5	----
. Electronics Industry group		
FILTERING FOR INFORMATION EXCHANGE	6	----
. Legislative Science Advisors		
AN INFORMATION SYSTEM FOR AN ACADEMIC COMMUNITY	7	----
. General Systems Theory		
BUILDING, VALIDATING AND UPDATING A DATA BASE	8	----
. Current medical wisdom gathering among experts		
RESEARCH ON TECHNOLOGY FOR THE HANDICAPPED	9	----
. Exchaning clinical and technology lore		
APPLICATIONS TO THE DISADVANTAGED	10	----
. Handicapped Children and Senior Citizens Example		
APPLICATIONS FOR INTERACTIVE EDUCATION AND PLANNING	11	----
. Self organizing aid to group discussions		
OFFICE AND MANAGEMENT AUGMENTATION	12	----
. Integrative communications view		
APPLICATIONS FOR SOCIAL RESEARCH	13	----
. EIES as a laboratory without walls		
EIES ACCESS POLICY	XX	----
. Gaining access and costs		
EIES PARTICIPATORY SEMINAR	XX	----

. A chance at hands on experience for a day for
small groups in organizations interested in
trying this new form of communication.

If the above material is not available with this listing then check off the items above that you desire and send to:

Anita Graziano
CCCC at NJIT
323 High St.
Newark, N.J., 07102

(or phone 201-645-5211)

*Viral Hepatitis: Ten experts are updating and validating a data base which synthesizes existing knowledge about this disease, for use by practitioners.

*Politechs-Legitech: Twenty-five state legislative science advisors exchange inquiries and responses about issues of legislative interest, ranging from toxic wastes to the licensing of child care centers.

*Field Trials with the Disadvantaged: Children in a cerebral palsy school and residents of a home for the aged use computerized communications to expand their intellectual and social world.

Utopian communities: Residents of utopian communities in Arizona and Scotland exchange ideas about building better human settlements.

*The White House Conference on Library and Information Services: 37 members of the national advisory committee and staff use EIES to plan a large-scale national conference.

*Joint Electron Device Engineering Council: Developing industry-wide standards for components and products.

Hudson Institute: Developing materials for seminars.

American Petroleum Institute: the Committee on Information Services, consisting of representatives of major oil companies, augments its regular meetings with continuous EIES communications.

EIES PAST AND FUTURE

Originally developed under National Science Foundation sponsorship, membership in EIES was by invitation only until the fall of 1979.   Now new members are sought to join at $66 each per month. People who want to try the new technology in new ways or evaluate how well it works for them are preferred.

"Eventually, we think there will be dozens of EIES clones, around the country and abroad," says Murray Turoff, EIES designer, "all linked together, with thousands of people using this new form of communication. Meanwhile, we are opening up the existing system for people to propose whatever applications they can think of." EIES operates on mini-computer technology and is relatively inexpensive compared to the telephone and most other forms of communication.

Further information on the system and how to gain access is available from the Computerized Conferencing and Communications Center, New Jersey Institute of Technology, 323 High St., Newark, N.J., 07102; or by phoning Anita Graziano at 201-645-5211.

EIES FACT SHEET #2
THE ECONOMICS AND TECHNOLOGY OF EIES: OVERVIEW

The EIES system is operational on a dedicated mini-computer.
Approximately 175,000 dollars could set up a turnkey copy of
EIES to operate for a membership of about a thousand
individuals. Any organization with 300 or more potential active
users could cost-justify such a system by comparing alternative
costs for mails and/or telephone to accomplish the same ends.

Based upon 90,000 hours of user experience, now running at about
7,000 hours per month, the throughput cost of operating EIES is
about $3.00 per hour. Adding to this the current costs of
TELENET (the nation wide digitial packet network used by EIES)
at $3.75 per hour, the effective cost for nationwide use of the
EIES system is less thn $7 per hour. At this rate EIES is far
cheaper than long distance phone charges and traveling to
meetings. In fact, the startling thing about the economics of
EIES is that the current technology is cost competitive with the
mail for user groups of 9 or more who wish to exchange
communications as a group on a regular basis.

For a detailed economic trade-off analysis of EIES with other
communication alternatives see the economics chapter in the
book: The Network Nation: Human Communication via Computers by
S. R. Hiltz and M. Turoff, Addison-Wesely Advanced Books, 1978.
It is the pragmatics of these cost tradeoffs that is leading to
the growing interest in and use of "electronic mail". However,
the concept of "electronic mail" reflects the fallacy of
thinking that computerization of a function can be a mere
automation of what we are doing now. However, this view
disguises the potential long term impacts of these technologies
upon organizations and the opportunities presented by viewing
this technology as a chance to design human communication
structures ideally suited to particular groups and their
applications.

To accomplish the objective of optimizing the design of specific
communication structures, the EIES system has two major
components from a technical standpoint. In the hard code of the
software system are the very general purpose functions for
messages, conferences, notebooks and the underlying general
purpose text file system and word processing. Coupled to this
is an interpreter of a special general purpose language
(INTERACT) which allows for the design of special communication
structures and group computer aids in support of individuals and
groups on EIES. Using this language, special capabilities can
be easily developed, tested and refined by experience and
feedback from the user groups. As an understanding evolves of
the nature of generaly desirable features these can be
incorporated into the hard code to gain efficiency. Likewise, a
specific group arriving at its own communication requirements
can then tailor its own clone of the EIES system to provide
optimum performance for its application.

As a result, EIES has been steadily evolving since it has gone
on the air in 1976 and will continue to do so. To accomplish

this it seeks to acquire new user groups interested in exploring this technology in a cooperative manner with the research staff of the Computerized Conferncing and Communications Center at NJIT.

EIES currently has invested in it approximately 35 person years of software development effort and about 10 person years of evaluation and assessment effort. While the current technology is tied to Perkin Elmer's INTERDATA line of minicomputer equipment, it is estimated that it could be transferred to other machines with about four person years of software work. We hope to work towards greater machine independence as we evolve a better understanding of the basic communication functions applicable to a wide variety of groups and applications.

In addition, the center is working on a number of related technical problems associated with computerized conferencing:

The ability of differing conference systems to interact in an intelligent distributed network so users on one machine can communicate with those on other machines without having to detect the fact that they are using more than one machine.

The ability of users to work on the composition of diagrams as a group.

The addition of graphics and the ability to handle special notations such as mathematics.

The use of microprocessors as personal aids to interfacing to EIES and other computer systems.

The transfer of material between computer systems utilizing a conferencing system as an intelligent transfer node.

Mini-EIES like systems based upon microprocessors.

Software language development associated with the implemenation and design of conferencing systems.

In the effort of assessing this technology the center is developing methods to evaluate individual, group, organizational and societal impacts of the technology and the relationship of those impacts to the design of such systems. It is very much our view that the design of such systems are, in fact, the design of human systems and the development and use of the technology cannot be divorced from the associated human and behavioral considerations.

For further information on EIES and the work of the Computerized Conferencing and Communications Center at NJIT contact: Anita Graziano, NJIT, 323 High St., Newark, N.J., 07102, Tel: 201-645-5211

EIES FACT SHEET #3
EIES AS A HUMAN SYSTEM

When 700 people meet in a common electronic communication space more convenient than mail or phone, no matter what their professional purpose on-line they will soon emerge as human beings. Behind the formal EIES structure is an informal social scene with a push towards sociability unique to this medium. People with widely different backgrounds find themselves sharing feelings and ideas, and often form friendships with those whom they would never have met otherwise. Many of the barriers occurring in more formal face-to-face meeting settings (e.g. status, maintenance of what is referred to as 'face') are minimized within the medium of computerized conferencing, thereby promoting a friendly and sociable atmosphere.

For its regular users, EIES has become a microcosm of society, with both familiar and new norms of etiquette and behavior. The following examples reflect the breadth of the EIES personal network, but cannot adequately convey its intensity, diversity, or importance to the people who are part of it.

Birthday, wedding, holiday wishes, vacation plans, divorce and death notices

pass through the EIES message system on a regular basis.

A person about to lose his job obtains a number of leads from colleagues and a great deal of moral support for his accomplishments and views which are not appreciated in his current environment.

A user checks the EIES directory for members in a city he is about to visit and arranges a very pleasant dinner.

A group of computer hobbyists trade war stories through an EIES public conference.

Various spouses discuss, through EIES, how to cope with their EIES addicted partners.

An EIES user in Paris supplies another EIES user about to visit Paris with details one does not find in the usual guide book.

An EIES user's seven year old daughter communicates with the seven year old daughter of another EIES user a thousand miles away.

A faculty member engaged in a major promotion and tenure battle enlists the aid of a nationwide group of supporters to review and consult on various issues and actions in the situation.

Seven researchers at different institutions prepare a joint proposal for submission to the National Science Foundation..

Some of them have never met one another face-to-face.

Electronic flirtations occasionally lighten a long nights work from a lonely room somewhere in the nation.

A number of EIES users obtain full or part time consulting jobs with others on EIES, in some cases never having met them. One or two members conduct the majority of their consulting through EIES.

A government official needs an urgent review of a proposal and obtains three knowledgeable views within 24 hours.

Amateur poets publish their literary creations in the EIES poetry corner conference under real or pen names.

EIES pen names often reflect the same flair and srit as CB handles, as in the following examples: Super Woman, Don Quixote, Catherine the Great, Voltaire, etc.

A number of EIES users in fairly significant political and corporate positions admit GIES is the place where they can escape from the day to day headaches and take time late at night to reflect and discuss long term issues of concern to them.

Students anonymously tell a professor what they think is wrong with his course.

An individual is fond of arguing with himself in some conferences by the use of pen names and playing the role of devil's advocate.

A group using Pen Names engages in a no holds barred encounter session within a private conference.

Some forty EIES users attend the first electronic New Year's Eve party. It goes on for six hours and midnight is celebrated four times as various time zones are crossed.

The medium seems to enhance the ability of people to exchange personal problems and numerous examples of this occur reflecting almost every area of human activity.

An individual describes his emotions and experiences in going through a near fatal medical situation and receives numerous reflections from other EIES members.

An apparent conservative masquerades as a pen name liberal and picks up a following of disciples for his literary essays.

An EIES user describes his experiences on withdrawing from the use of pot.

ACCESS POLICY
Electronic Information Exchange System (EIES)
at the
New Jersey Institute of Technology

The Electronic Information Exchange System (EIES) is a computerized
conferencing system designed by Murray Turoff and operating at the
New Jersey Institute of Technology. It uses the abilities of a
computer to facilitate human communication. EIES is an integral part
of the Computerized Conferencing and Communications Center. It
provides a field laboratory in which individuals can experiment and
utilize the most recent developments in the technology. EIES is the
vehicle for establishing feedback between R&D and evaluation efforts
and "real world" user communities. The Center has evolved an
extensive methodology for evaluating this technology and its
application, based upon more than 70,000 hours of user experience
with the EIES system through September 1979.

EIES is a fixed-capacity resource which will accept a maximum of 450
Class 1 users. Preference is given first to any group interested in
the evolution, evaluation, assessment and/or applications of this
technology. Our concern at NJIT is with the structuring of human
communications by computer technology to facilitate the objectives of
cooperative groups. Therefore, groups willing to collaborate with us
in allowing us to observe how they use the system, or in aiding us to
develop the tools they need on such a system receive first
consideration for membership. Groups interested in conducting or
participating in evaluation activities, in designing and developing
new software tools, or in conceptualizing new applications fall into
this category.

Some of the key areas currently being explored under the NJIT
research program are: Office Automation, Decision Support Systems,
Public Utilization, Disadvantaged and Handicapped Applications,
Scientific and Technical Information Exchange, Medical and
Educational Applications. We are particularly interested in groups
wishing to experiment in these areas.

The second category are groups and wish to utilize EIES who represent
academic, non-profit, professional and trade associations, research
activities, governmental bodies, foundations and citizen and
community groups. - In these cases we will monitor the group's
activity data. Within this category, preference is given either to
groups who represent a new and unique application or population of
users, or to groups whose nature and objectives relate to or
complement the existing user population.

We expect all groups to cooperate in providing us information on the
degree of success they have in utilizing EIES. The method of doing
this will be worked out on a case-by-case basis. No single group can
obtain more than 100 membership slots on EIES and no group can be
given more than a two-year initial commitment to membership.
Individual memberships will be viewed within the same set of
preferences.

EIES' BASIC CAPABILITIES

The basic EIES system supports electronic messaging, conferencing, personal notebooks, text editing, and document preparation. It includes a multitude of specialized features such as voting, automated questionnaires, and data-gathering to facilitate group communication processes.

EIES has five alternative human machine interfaces, from simple menus for the beginning and casual user to self-defined user commands and procedures for customized tailoring of the interface.

EIES also allows the development of specialized subsystems for specific tasks. This has been utilized in such areas as legislative information exchange, standards setting, project management, and social experimentation and forecasting. See the EIES application fact sheets for more details.

MEMBERSHIPS AND COSTS

CLASS ONE MEMBERSHIPS

These memberships entitle users to priority one service and a private conference and notebook with an allocation of 200 full-sized pages of text. For a group of memberships, the 200-page limit is considered to be an average figure per member for the entire group. When an individual member is engaged in activities of interest to other EIES members, we will continue to be selective in enforcing this limit. The cost for a Class one membership is $66 per month with no hourly charge. A free group conference and notebook comes with every group of 10 members.

CLASS TWO MEMBERSHIPS

These users do not get a private conference or notebook and can experience degradation in response time when the system is heavily loaded. Groups may purchase class two slots in a ratio of one class two slot for each three class one slots purchased. The cost of these slots is $15 per month and $1.50 per hour of use. The class two slots allocated by NJIT are primarily to allow new people to explore the system.

MULTI-USER ACCOUNTS

In these accounts many hundreds of individuals can share access to one slot for private messages with each other and with other members of the EIES system. A maximum of 10 such slots is planned, and they

will largely be allocated to groups that wish to expand the results of their activities to wider readership. The members of multi-user slots will not be entered in the EIES Directory, but they will be listed in a new Directory component called INTERESTS, which allows groups to self-form about topic areas. Many of these slots will be tailed to allow a group to distribute specific material to the users of these multi-membership slots. The cost of these slots is $100 a month plus $1 per hour per user.

SOFTWARE DEVELOPMENT

For those interested in developing specialized computer augmentation for their communication processes, the INTERACT programming language requires about a month's learning time for an experienced programmer. The Center has computer science students trained and willing to undertake programming at very reasonable rates. Specialized design talent in this area is also available through the Center.

EVALUATION AND HUMAN FACILITATION

A number of experienced EIES users are available on a consulting basis who have significant experience in evaluating the use of this technology and/or facilitating human communication processes.

DATA BASE APPLICATIONS

While EIES is not designed to support data base applications of a very large size, it can reasonably support text files or files that have been restructured to superimpose a data structure on text items. EIES also has an extensive indexing capability available through the INTERACT programming language. Public notebooks with thousands of entries are conceivable. EIES is particularly ideal for evolving the design of a data base system by interaction between the designers and users based on a pilot or architectural model of the system done in INTERACT. Details on the effort involved in learning and utilizing INTERACT are available on request. For those who wish a very large file, the cost per each 100 full pages is $10 per month. (A page is over 5,000 characters).

EIES FEE SUMMARY

ACCOUNT	MONTHLY RATE	HOURLY RATE
CLASS I	$66	NONE
CLASS II	$15	$1.50
MULTI-USER	$100	$1.00

OTHER FEES:

TELENET

MAINLAND US $3.75

HAWAII $6.50

CANADA* $6.50

Use of TELENET allows connection to EIES by a local phone call in
more than 150 U.S. cities. Those with leased lines able to phone the
EIES facility directly in Newark, New Jersey may avoid this charge.

*Cost of Telenet in other foreign countries available upon request.
For further information contact:
                    Anita Graziano (107)
                    Computerized Conferencing
                    And Communications Center
                    323 High Street
                    Newark, New Jersey 07102
                    (201) 645-5211/5212

For background reading see "The Network Nation" by Starr Roxanne
Hiltz and Murray Turoff, Addison Wesley Advance Book Program 1980.

MINIMIZING RED TAPE

It is our objective to minimize the cost of EIES to its users and
groups. To accomplish this, we must limit paper work. Our billing
policy is that monthly charges for individuals must be paid for three
months at a time and in advance. Groups of more than three may pay
one month in advance. Also, hourly charges must be paid before they
are allocated. If Purchase Orders are used with no advance payment,
there will be a $10 fee for each bill that is processed.

Appendix 2

Electronic Information Exchange System

CHIMO Index

Y ISSUE WITH +CHIMO # (OF ISSUE). ACCESS ANY PAGE WITH
~+GET N1000P# (OF PAGE). +GET N1000P175 SHOWS DATES AND N1000 PA
NUMBERS OF EACH CHIMO ISSUE. +GET N1000P176 SHOWS WHICH LETTER OF TH
ALPHABET IS INDEXED ON EACH OF THE N1000 PAGES FROM 250 TO 270 (THIS I
PAGE 250, "A"). THUS TO FIND CHIMO COVERAGE OF A PARTICULAR TOPIC
CONSULT THE PAGE OF INDEX WHICH N1000P176 INDICATES IS LIKELY TO HAV
THE TOPIC YOU WANT. THEN ACCESS THE ISSUE OR PAGE NUMBER SHOWN TO TH
RIGHT OF THE ITEM WANTED. ADDING A T TO ANY ITEM DESIGNATOR (E.G. +GE
N1000P1T) WILL PRINT THAT ITEM WITHOUT THE IDENTIFYING HEADER.

XYZ
~MESSAGE CHOICE?--
NO MESSAGES WAITING.

FRED G. THOMPSON (FGT:345) OFF AT 1/28/80 7:55 AM

TIME USED: 0:46
~CUMULATIVE: 67:23
ALLOCATED: 70: 0

Appendix 3

Results of Survey Interviews in the Business Community

1. I.P. Sharp Associates
2. Infomedia Inc.   (PLANET)
3. Canada Systems Group
4. Bell Canada/Bell Northern Research (COCOS)
5. Multiple Access Group
6. Comshare Ltd.
7. Company "A".
8. QL Systems Ltd.
9. HERMES
10. AES Data Ltd.
11. Hewlett-Packard (Canada) Ltd.
12. Company "B".

Item 13 - Data Communications NEWSLETTER. (August 1979)

Appendix 3

Survey Interviews in the Business Community

1. <u>I.P. Sharp Associates Ltd</u>. This organization has
   350 employees in some 90 locations throughout the
   world. Supervisory and technical staff use the
   IP Sharp MAILBOX system for administration and
   exchange of technical information, between all or
   any of the points in the system. A typical user
   would belong to 4 or 5 communication groups
   established by particular subject or area of
   interest relevant to his/her work. The user will
   check in at the terminal each morning to pick up
   incoming mail in print-out form – usually 5 or 6
   messages. These will be taken to the work place
   and responses prepared for input later on that day.
   The user will access one of several terminals located
   near his office or desk. Messages will be sent to
   members of appropriate groups or to individuals,
   as the situation dictates. The subject matter will
   be administrative, technical or occasionally a light
   social exchange.

2. <u>Infomedia, Incorporated</u> of Palo Alto, California
   markets the computer conferencing program and service
   called PLANET which was first introduced in February
   1977. A typical customer package would be a Conference
   with capacity for 125 sub-conferences and 125 terminals
   or participants. Some 50 such packages are used by
   companies, government agencies and institutions to run
   the affairs of the organization. A typical user would
   be a large corporation running projects around the
   world where specific projects would each have a separ-
   ate conference sub-set where messages could be sent,
   picked-up, recalled and stored, from many points
   geographically dispersed.

Infomedia uses the system for their own business affairs, and value the complete transcript of communications that becomes available from the system. Most professionals have their own terminals at home and often put in 2 or 3 hours a night on them. In this regard it was noted by the company that the computer connect time of clients often shows 50% of it is spent on week-ends!

Costs of this service, including line charges were estimated by the company at $40 per hour of connect time in the U.S. It was noted that these charges are higher than simple messaging because of the increased services provided by the conferencing features - and also that this level of cost is not likely to decline significantly in the future. Company business is reported to be doubling every year.

3. Canada Systems Group markets the computer messaging service called COMET, for its originator, Computer Corporation of America in Boston. It is a message system that will, as its commands indicate

compose

edit

send

scan

read

answer

file

retrieve

The marketing and use in Canada has just recently begun, but companies that have taken on COMET for administration purposes apparently are progressively increasing the number of outlets in use as people get familiar with, and used to it.

The Computer Corporation of America, of Cambridge, Mass. report that they have 2,000 outlets (terminal points) on their own network throughout the U.S., Europe & to Australia to serve the needs of their own company. This has been in operation 2½ years, and now, it is claimed, they hardly see any paper; many forms, such as travel request forms, no longer exist. The typical manager or executive has a terminal in his office, accesses it 3 times a day - when he arrives at work, before lunch, and at 3:00 p.m. The marketing executive contacted, says he often accesses the terminal for messages before breakfast, and 2 or 3 times over the week-end. He finds this is more relaxing since he can deal with problems as they arise and face Monday morning with less surprises. He added that, with the computer terminal in his home, his young daughter is growing up thinking everybody has computer terminals in their homes. In fact, in this Boston suburb of professional people, he says there is a terminal in half the homes down the street.

The cost structure for COMET in Canada is $125 per company subscription per month; plus $60 per month for each user (mailbox address) for up to 7 hours of connect time (per user, per month) and storage of 500 messages. This would average out at about $10 per hour for user plus line charges (Datapac).

A description of one company's (GTE) experience with COMET in the U.S. is shown at the end of this Appendix. Note the typical per message cost of $1.50.

Enquiry as to the expected rate of growth of this type of communication in the total business community elicited the response that the industry expects it will double each year for the next five years - but their own company growth in this field has, it is reported, consistently exceeded that rate of increase over the past 20 months.

4. <u>Bell Canada - Bell Northern Research.</u> Bell and BNR
   use an in-house computer communication system called
   COCOS. It interconnects all their North American
   plants and offices and is used for information ex-
   change of administrative and technical nature.
   Most managers and officers have a terminal on their
   desk, or in their office and an estimated 40% access
   the terminal themselves and the balance use a
   secretary to relay their messages. For those without
   a terminal they can prepare a memo on a specially
   prepared form which is picked up by a mail-room
   messenger, typed into COCOS and sent on its way. If
   the addressee has not a personal terminal, the computer
   automatically routes the message to the nearest
   mail room. The mail room attendants clear their
   computer mail several times a day and deliver by
   hand. This process extends the computer mail service
   to some 2,000 people whereas the direct access via
   one's own terminal is for a network of about 400
   persons.

   Use of the system is currently increasing at 5% per
   month as its popularity grows. Middle management send
   and receive a total of about 40 messages a day. A heavy
   user accesses the terminal from 60 to 100 times a day.
   Phone calls are down, and a mail count showed a direct
   correlation between increase in use of computer mail
   and decrease in letter mail. A secretary was observed
   who had at her workplace, a computer terminal with
   CRT and keyboard, a typewriter, and a Word Processor,
   in that order of proximity to her chair (on wheels).
   Her manager had his terminal right beside his office
   chair. He accessed the terminal Monday morning at
   9:00 am, to demonstrate, and found several messages
   waiting. One was the minutes of a management meeting
   held the previous Friday afternoon; the time of
   input to the computer was noted as 3 pm Sunday.

Another example was quoted by this executive: he requested verbally of his secretary at 9:00 am that she set up a meeting that same day at 3 pm, and he left the premises for other business. She sent messages out on her terminal to the various people who are continually accessing the system - it was possible to complete the necessary arrangements by the afternoon deadlines and know for sure who was to be there and if not why not. Normally this would be done by telephone and a lot of delays incurred. This manager also said it is often easier and quicker to input the terminal one's self than relay the information to his secretary for making certain arrangements. She would get the copy of his message on her terminal in the normal process, and follow-up on her own. This arrangement maximizes the manager/secretary effectiveness and creates a new potential in this work relationship.

The system to work effectively needs a critical mass of users. This has been reached at Bell-BNR and so the system is now steadily growing as more people discover it. Storage of messages has been running at 6% which indicates that most messages are not kept and the electronic filing system is lean. A number of people in this company were reported to have personal computers at home - TRS-80 and Apple.

Bell recently announced the marketing of a computer communication service called "ENVOY 100" to be launched in November 1980.

5. Multiple Access Group. This company sells computer
services across Canada and has a communications
network to all of the 8 branches. The network is
used chiefly for data transmission, but because
it is there it is also used for a limited amount of
message sending. Messages are typed into one of
several terminals in a particular branch by support
staff to the extent of an estimated 3 or 4 items
a day. The company is part of the Canada Systems Group
but do not use the messaging package COMET provided
by that firm.

6. Comshare Ltd. This computer utility has two
messaging systems of different service levels,
with connections throughout Canada and into the
U.S. and Europe. The system is used for assisting
in doing their own company business and as a service
to customers of their other computer services. One
senior executive reports he checks his computer
mail once or twice a day through his secretary, and
sends messages the same way. The office manager
of one branch uses the computer mailbox service
once or twice a day on inter-branch business. She
reports she would be "lost without it".

7. Company "A" The use of computer mail by this large
computer service company has not been developed.
Messages are sent as news bulletins to large groups of
people on the system but it is not used on a one-to-one
basis in the regular conduct of their company business.
One manager reports hand writing messages then passing
these to his secretary to input the electronic messaging
systems, two or three times a week. A mail box service
as a separate item is not marketed by the company.

8. <u>QL Systems Ltd.</u> Q/L Systems is a computer service
   company with 25 employees; head office is in Kingston,
   Ontario and branch offices in Toronto and Ottawa.
   The company provides three computer based systems -
   QL/SEARCH which is an information retrieval system
   QL/ TEXT which is a text editing system and QL/MAIL
   which is a computer messaging system. In the Ottawa
   office the Marketing manager and office manager use
   the messaging system on and off all day. The terminal
   with CRT is beside their desks, and a printer facility
   is available nearby. Messages are continually flowing
   between their offices in Toronto, Kingston, Ont., and
   Ottawa. Each officer turns on the terminal on arrival
   at the office in the morning and accesses the system
   perhaps 20 times a day, as it is handy, readily visible,
   and is in use by all administrative personnel.

   The marketing manager takes a portable terminal
   home, sometimes for a week-end and occasionally
   during the week to work at home. She also takes
   the portable on sales trips and keeps in touch
   with the home base daily, or several times a day
   from where ever there is a telephone and electrical
   outlet.

   QL/MAIL is part of the larger text editing system.
   QL/TEXT can be used by subscribers for composing
   correspondence, writing and editing reports,
   preparing manuals, and even building up ones'
   own data base. Subscribers are presently connec-
   ted to the system throughout Canada and also in
   the U. S. A. and Europe. The future of the system
   is seen by these people as a terminal in every
   office, and this supported by a terminal at home.

9. HERMES is a program package developed by the
    U.S. Department of Defence's Advanced Research
    Program Agency (ARPA). A network of large computers
    are connected throughout the US as ARPANET.

    In this survey two instances of the use of HERMES were
    identified. One use was in the U.S. Department of
    Commerce in Washington where 8 persons were constituted
    in to a small network to try computer messaging in an
    office milieu. A second one was in Boston to
    experiment with computer communications between and
    among a group of about 45 deaf people. The HERMES
    system includes text editing and is the simplest
    of all messaging system to use, according to two
    respondents.

10. AES Data Ltd. This company manufactures word
     processors which are capable of acting as
     messaging systems, either directly between word
     processors (point-to-point) or through a host
     computer with store and forward facilities.
     For their own business affairs they use both
     point-to-point and the word processors as terminals
     in the mailbox program of a computer service
     company. The latter is used mostly for Europe and
     foreign countries. Executives and the managers
     use the system through their secretaries or the
     typing pool. Correspondence normally goes by Post
     Office mail, but rush letters and messages go by
     point-to-point communication via word processor.
     Because of off-line composing and sending at 2400
     baud the time on the telephone line is relatively
     short and the cost correspondingly low. Such
     messaging is feasible between AES machines only,
     and the receiving machine must be on, and in the
     communication mode at the time of sending. The

point-to-point system operates on regular telephone
lines using the number of the regular phone at the
receiving end and both machines connect to the line
with a Bell Canada modem. It is interesting to
note then, that the intercommunicating network can
be as big as the telephone system as long as there
is the appropriate word processor at each end of the
line in the communicating mode.

11. Hewlett-Packard (Canada) Ltd. This company operate
their own world-wide computer mail system among
some 100 or more locations using their own computers
(HP2026). They began with a world-wide ordering
system, supported by an IBM main-frame in Palo Alto,
which takes orders by computer mail network, allocating
to the appropriate manufacturing plant, - or plants.
It considers plant production schedules, determines
delivery date and reports this back to the salesman
within two days. In Toronto the staff fill out
forms by hand with messages, or equipment orders;
they are picked up by the office messenger, taken
to the terminal room, where 10 operators are
occupied full time inputting to the computer network.
The company provides communication software for
the appropriate equipment so that customers can
operate their own computer mail systems.

12. Company "B" This company uses computer messaging
extensively through a world-wide network of some 2,000
points. As reported by an executive in the assembly
plant, a number of managers have terminals on their
desks dedicated to electronic mail and send and receive
messages by this medium. Messages are sent and received,
travel forms filled out, meetings called, discussions
generated, via the computer terminal. Most of those
with terminals access them personally rather than

through a secretary. Users log in 4 or 5 times
a day. Paper work has been cut significantly and
phone calls greatly reduced. The system has been
operating in Canada and the U.S. for over a year.

An operations executive was interviewed at his
place of work. He had a terminal (CRT and keyboard)
on his desk. His secretary had 2 terminals (CRT with
keyboard and printer with keyboard) and a typewriter.
He liked the way the system handled meetings. If
he - or his secretary - called a meeting, he (or she)
could check at any time to see how many and who were
coming, and when he walked in the door to start the
meeting he would know whom to expect and why the
others could not come. In many instances issues and
crises could be resolved, before a meeting would
become necessary. He recalled one crisis involving
input from 15 executives, which was resolved in one
day, and, he reported, such a quick resolution would
not have been possible any other way. He finds the
computer messaging is more effective than meetings for
assigning tasks and checking progress and production
reports.

He noted one possible disadvantage that computer messaging
can create, and that is information overloading. It
has already been felt.

DataCommunications

Newsmaker

David R. Lockwood

Marketing director spearheads drive for internal electronic mail

We're continually told that necessity is the mother of invention. For David R. Lockwood of General Telephone & Electronics, that necessity has led to the development of a mushrooming success story in the electronic mail industry.

Lockwood is the founder of an electronic mail network used internally at GTE by an increasing number of users. What is unique about the electronic mail setup is that its impetus did not come from the communications or computer departments, but from a user group within the marketing department.

The need that led to the network, says Lockwood, who is now the manager of the company's Automated Office Communications Systems, was a reorganization of GTE's nationwide marketing organization. Before the revamping, the company's 17 operating telephone companies throughout the U.S. and Canada reported directly to corporate headquarters. To streamline the reporting procedure, GTE management established three segments — the operating telephone companies report to regional management, which, in turn, reports to corporate headquarters.

Solution. The electronic mail operation, says Lockwood, was born to solve communications problems that developed as the reorganization was implemented. Because both electronic communications and travel increased dramatically for him and other members of the

marketing staff, his company decided to go the electronic mail route to solve the problem, choosing the Comet network from the Computer Corporation of America (CCA), Cambridge, Mass. Comet is offered as a dial-in service that allows users to transmit messages among themselves. Also, messages can be stored for future reference, permitting an extensive record-keeping capability to develop over a period of months.

Saves calling. The electronic mail service, which costs about $1.50 per message when usage and terminal costs are added together, has succeeded because of time and location factors. "The greatest benefit," says Lockwood, who likes to have some spare time for his wife, three children, and hobbies — such as amateur radio, bridge, and an occasional round of golf — "is that the service is not time dependent. I don't have to get somebody else on the telephone line. It is particularly valuable across different time zones."

Comet replaces both memos and telephone calls, says Lockwood. "We generally spend less time in the terminal/message mode than we did on the telephone, plus it is much faster than handwriting. It does require the executive to type, but we have run across only one person who has refused.

"I now carry a TI Silent 700 with me at all times when I travel. When I first did it I thought it was a cute idea. Now I won't leave without it. To give an idea of its power, I've been traveling for the past two weeks, but when I returned I had only three messages on my desk. Three times a day I would check

In touch. David R. Lockwood talks with his marketing colleagues at GTE via an electronic mailbox.

my mailbox (via Telenet's packet network) and receive all my messages. I did not feel I was out of touch with my office and the people I communicate with."

Development problems. Electronic mail networks are not new by any means. What is significant about Dave Lockwood's experience is that he isn't a technologist advocating the use of electronic mail simply because the technology exists. Most of his career has been spent with Addressograph-Multigraph, selling credit card processing systems (nine years), and with GTE, as a consultant in office management and marketing (14 years). In his mid-40s (he declines to give his exact age), Lockwood has been around long enough to know that usability of any electronic system "is the true key to its acceptance."

Lockwood also has an understanding of the limitations of the electronic mailbox network. "One of the problems," he says, "is that you have to have a large enough cadre of people who communicate on it before it becomes of any real value. They have to be the people you communicate with regularly. Then, each person adds value to the network. This has been a problem with evaluation study groups in the past. There wasn't enough size or focus. For me, it was months before I saw a drop in my telephone calls. But now, of the 16 to 18 people I communicate with regularly, all have mailboxes. My calls have dropped substantially."

Future plans. Dave Lockwood has no intention of keeping control of the mail network himself. "I have a theory about central services that they are demand-responsive groups. They don't do anything until somebody asks."

As for Lockwood's electronic mail service, he says that the communications department at GTE should be able to operate the network in house when it reaches 125 users. CCA sells its electronic mail software for about $40,000. In April 1979, GTE's network had 40 users, and is now at about 80—and growing fast. The cost per user is $60 per month plus terminal fees, for seven hours connect time and storage of 500 messages.

Appendix 4

The Community Memory Project

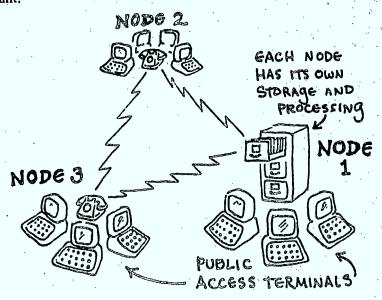# The Community Memory Project

an introduction

January, 1980

I. What is Community Memory?

Community Memory is a system for the public management of public information. It is an open channel for community communications and information exchange, and a way for people with common interests to find each other. It is a shared community filing cabinet. It is a tool for collective thinking, planning, organizing, fantasizing, and decision-making.

The Community Memory system gives people a place to store and label information, which can then be selected, sorted, and fished out as needed. All the information in the Community Memory is put in directly by the people who use the system: anyone can post messages, read any of the other communications that are there, and add comments or suggestions at any time.

By being open and interactive, Community Memory seeks to present an alternative to broadcast media such as TV. The nightly national TV news -- both commentary and commercials -- gives people the "word" from on high, telling us "that's the way it is." Community Memory is different. It makes room for the exchange of people-to-people information, recognizing and legitimizing the ability of people to decide for themselves what information they want.

The Community Memory system is a network of small computers with large memories, each connected to 10-20 computer terminals. These terminals are for direct public use. People can type in messages with a typewriter-like keyboard and get messages either displayed on a TV screen or printed out on paper.

Each set of terminals around one computer with memory storage is called a "node". In each node, the terminals are all hooked up together and any information in the node can be taken out through any terminal. As the Community Memory network grows, nodes will be interconnected into larger groupings as part of a regional or national network.

The projected incarnation of Community Memory is a broad dispersion of computer terminals in public places, such as community centers, libraries, stores and bus stations. A Community Memory node might also be shared by people who are working on some common project in different parts of the country -- the "community" here would not mean one geographic locality, but would represent a community of common interests.

II. Why Community Memory?

The designers of Community Memory would like to see a world not broken up into nation-states or corporate states, but one built upon many overlapping regions of concern: from household to neighborhood to interest group or work group, from geographical region to globe, where decisions are made by all those affected. This would be a world where power is distributed and governance is the process of collectively trying to determine the best action to be taken, via general discussion and complete dissemination of information. With this vision, the Community Memory system has been designed to be a communications tool for a working democracy.

The purpose of Community Memory is therefore to support the direct and unmediated exchange of information among individuals and groups. The system is designed for communications and collective planning and decision-making, rather than for accounting, statistical analysis, or general office tasks. Community Memory could be used to form libraries, prepare newsletters, and aid the planning, decision-making, and day-to-day work of federations,

cooperatives and collectives. By both supplementing and comple-
menting existing community communications systems, Community
Memory has the following advantages:

A. Availability.

Although we have described the system as a shared commun-
ity filing cabinet, it won't require its own office or continuous atten-
tion by staff. We propose to install terminals in, for example, com-
munity centers or the offices of community-based organizations
which have a high level of drop-in traffic. Other terminal sites
might be free clinics, libraries, community food stores, coffee shops
or even laundromats. Sites will be selected by people from the
community where terminals will be located.

B. Community Control.

In contrast to most information services, Community Memory
will have no staff people mediating between "clients" and informa-
tion. People can enter any message or question they want, and
obtain information anonymously and without having to fill out any
forms. They can add comments to existing messages, organize
conferences, carry on conversations, and make their own connec-
tions. These features give the community of users a great deal of
control.

C. Appropriate Communications Technology.

As an accessible, non-hierarchical and interactive public
medium, Community Memory will be unique among current com-
munications systems. It has certain similarities to pay telephones,
public libraries, radio talk shows, and bulletin boards, but it has the
potential for being a far more powerful tool than any of these.

The system is also unique among other small computer "infor-
mation utilities" which are being marketed for home and office. To
date, commercial systems which run on a personal computer or
hook up to the home TV set seem to perpetuate a one-way flow of
information, from "providers" to "consumers". Such systems seem
mainly designed for individual use for playing games or receiving
the stock market reports, rather than for communications and
information exchange. The commercial systems thus do little to
overcome people's continued isolation from each other.

D. Interlinking of Communities.

A "community" can be a geographic, economic, cultural, political, or recreational entity. By helping its users connect to others who share their interests and concerns, Community Memory can strengthen people's involvements in many overlapping communities and help them work together toward common goals. When Community Memory nodes become widespread, a user will be able to dip into the memory of a node a thousand miles away (for a small additional fee). This ability to browse far and wide over the system should increase the chance that a user can make a useful connection.

III. The Limitations of Community Memory.

Community Memory is a very useful tool. However, like any tool it can go unused, be misused, or be used too much. A few things should be made clear:

A. There are Other Tools.

The purpose of Community Memory is to aid in decentralizing control of communications and power relations in general. A ditto machine can be used for the same goals, as can the higher technology of the Xerox machine. Community Memory is an electronic filing cabinet, but often a "mechanical" filing cabinet is more appropriate. Computer technology is very sexy. It sells well, and it can frequently be used for tasks which could not be reasonably accomplished another way, but it is expensive, complex, and hard to make reliable. If something can be done adequately without computers, it *should* be done without computers.

B. The Technological Fix is an Addiction.

Community Memory is a demonstration of the potential of technology to be used for human liberation. However, the existence of a potential does not assure or even make likely its utilization. Like solar energy, radio, etc., the realization of the possibilities must be accomplished in opposition to the current organization of power in the society. The structure of society will not be changed to the disadvantage of those currently holding power by the introduction of *any* new technology or application of technology, although the powerful frequently use technology to their own

advantage. (Prince Peter Kropotkin, 19th century geologist, ecologist, and Russian revolutionary, is quoted as having said that while steam power concentrated production in large factories and caused the demise of the small workshop, the introduction of electricity, which provided easily distributed energy, would reverse the process of concentration. Such mistaken optimism about new technologies is still common.) New technology for managing information and making decisions is a *requirement* for a *humane world*, but it can't replace the political process. Only humans can build a humane world.

IV. How Community Memory Works.

Address the keyboard.

Press any key, and a program in the computer will print out a message with introductory remarks and instructions. The program will then ask you for your next move -- either entering a message, or finding information. The most basic functions this system performs are variations on "enter" and "find". It is designed to record, sort, store, retrieve, and display text messages.

HOW TO ENTER.

Suppose you wanted to enter a message. You would first select the entry function by pressing the "Enter" key. The com-

puter program would respond with instructions, and then "prompt" your response with the request:

"Enter message:"

You would then type in a message, such as:

"I have 15 dozen large brown eggs for sale, at $.50 per dozen, in flats. Buyer must provide own transportation. Call Mac at 843-0888 any time."

When you have finished this part of the message, you press another key, and you will then be asked to label your message so that you and others can find it again. The program puts out another "prompt" (question asking user for a response), namely,

"Labels?"

Then you type in as many labels, or "keywords", as you like, for example:

> eggs
> eggs for sale
> farm produce

And that's it. You can now press a key to finish the transaction and make your message part of the data base. Each message is automatically marked with the date it was put in and the location of the terminal on which it was written. For example, the previous message might automatically receive the labels "Clarkeville" and "11-25-79" indicating that it had been entered on that date at the Clarkeville terminal.

This example of a straightforward "for sale" message is only one possible type of message. Messages can also be personal notes, conference comments, editorials, factual information, or resource lists. For example:

"Looking for someone with experience in building a passive solar room heater on a south window. Call Ellen at 652-0652 after 6 pm."

Labels:
solar
advice wanted
passive solar
solar heating

or)

"Jenny Carson I have your brown leather jacket. Come see me at Garrety's any weekday 9-5. - Sharon. "

Labels:
lost and found
Jenny Carson

or)

"The senior citizens of Clarkeville are organizing for better housing for the elderly. If you are 65 or over and live in the Clarkeville area, give Sarah Johnson a call at 754-7683 or come to a meeting Monday, October 10, at First Presbyterian Church, 4 p.m."

Labels:
senior citizens
housing
organizing

These sample messages are simple, but they are sufficient to illustrate the main purpose of this system: to connect people to each other -- not to attach them to computers. Community Memory computers allow users to find and use local resources and to get more information directly from people who have it. They don't try to be machines that can answer everything. Like all computer systems, this system can only repeat back what has been put into it, but it can collect information from many different messages and bring them together in potentially useful ways.

HOW TO FIND.

This brings us to the other main function, finding. Here again a computer program will ask you a question, such as

"Find what?"

If you then type in a request, such as:

FIND "eggs for sale", the program will find all the messages which have "eggs for sale" as one of their labels. The computer might then report: "7 items found. Do you want to see first lines?"

If you answer "yes" the first lines of the items will appear. You can then select the items you would like to see in their entirety.

Labels are extremely important for finding the messages you want. When entering a message, you should select its labels carefully so that others will be able to find it easily. When searching for information, you can sort through messages most efficiently by stringing together the labels that best describe what you are looking for, separating labels with AND, OR or NOT as needed.

In the above example, you could be more selective by using more keywords, like this:

FIND eggs for sale AND price LESS THAN $.70/dozen AND Clarkeville AND date LATER THAN 10-29-79

Then you'd get listings of eggs being sold at the price you wanted to pay, and available in an area that's convenient for you. By specifying a boundary on the date, you don't have to look at listings you've already checked.

Always read the label.

In another example, if you said:

"FIND solar AND passive AND heating NOT swimming pool heaters", you would come up with the subset of messages that concerned passive solar heating systems (but not swimming pool heaters). If you said "FIND solar OR passive", you'd get all messages labeled solar, and all messages labeled passive, including such things as "passive resistance."

A list of all current keywords will be available both on the system and in printed form, to encourage people to label similar kinds of messages with consistently similar keywords.

WHO'S IN CHARGE HERE?

Rather than dictating how Community Memory should be used, the designers of the system intend that the USERS shall take responsibility for the maintenance and usefulness of the data base. Users will be able to keep the data base viable in several ways. First, the system allows any user to make comments on any message found. These can be editorial comments, criticisms, or suggestions about where else to look for additional information.

For example, to the message "Mr. Ed will speak at the next meeting of the Rank and File Coalition," someone might add the comment, "For an insightful critique of Mr. Ed's position, see the last issue of ABC Newsletter." Or, the buyer of a car that had been advertised on Community Memory could tack on a comment, "Sold", which would be retrieved with the "for sale" message and would have an effect similar to pasting a "sold" sticker over a real estate sign.

Other comments might be more controversial or confusing. A message, "John Green is a great VW mechanic. Cheap too." might attract the comment, "Green doesn't know what he's doing. He forgot to tighten down my oil filter and I lost all my oil. Nearly wrecked my engine." Such an exchange might just represent different points of view. But there'd be no assurance that the message itself wasn't entered by John Green himself -- or the comment by the local VW dealer who doesn't like the competition.

The unrestricted nature of this information exchange system gives it many possibilities and a few problems. Although it can allow for minor spelling mistakes and warn you if a label you attach

has never been used before, the system cannot eliminate duplications, or guarantee the reliability or completeness of information in its messages. In the final analysis, the quality of the information in the data base will depend on the system's users.

Since memory storage is fairly costly, it is probable that messages will automatically "expire" and be removed from the system after a certain number of days or weeks. Even so, outdated messages may sometimes stay on file longer than they should. There may also be some items, such as comprehensive resource lists, which will be kept around more or less permanently and updated as needed.

Usually, no one except the original author of a message can change or delete that message (before its agreed-upon expiration date). However, every set of terminals will have one staff person (the "circuit rider") who is responsible for helping maintain the data base and respond to users' advice. (Previous experiments showed that users will perform many of these functions themselves).

Since users have the ultimate responsibility for the usefulness of the system, the social support structure for this information exchange tool is as important to its function as electricity. The terminals in any node can be grouped in one local area or spread out among a network of people who share some common interest. The users, connected either by geography or area of interest, can decide how best to keep the system running well, with guaranteed open access and a minimum of barriers to efficient and comfortable use.

V. The History of Community Memory

This description of the Community Memory system is based on previous experience -- it's not just wishful thinking.

· Between 1973 and 1975, the first incarnation of the Community Memory communications system appeared in the Bay Area. Small computer terminals were put in the lobby of a music store, in a hardware store, and in a branch of the San Francisco Public Library.

Although there was very little advertising other than word of mouth, the terminals were used up to 70% of the time that they were available. In fact, there was usually a line of several people waiting to use the system, which was made available free of charge.

On a good day, about 30 people used each of the terminals. More than 8,000 entries were made over the course of the 14-month trial period.

The system proved to be easy to use even for people who had never seen a computer terminal before. In fact, it was essentially "self-teaching." People learned how to use the system by looking over other people's shoulders or by following a set of simple instructions.

The terminal at Leopold's Records in Berkeley was installed during the August housing crunch, and it became immediately useful in the students' searches, with the rate of success growing with the size of the data base. Musicians looking for other players entered their names and their specialties. Instruments were bought and sold, producers found new opportunities, and groups advertised for gigs. New groups were even assembled on the spot from leads found in the data base, and from people waiting around for their turn to use the terminal.

Similarly, people used it to assemble car pools, organize study groups, find chess partners, and pass on tips on good restaurants. Interesting and unanticipated uses developed: poems, graphics, dialogues among strangers, and political commentary.

Users often entered public interest messages, such as the following:

"The San Francisco Water Department would like to increase rates charged to water users by 17.4% effective 1 July 74 Application for this increase has been filed with the San Francisco Public Utilities Commission and a public hearing will begin at 2:30 p.m. Tuesday 25 June 74 at Room 282 San Francisco City Hall.

Interested persons would do well to appear at the hearing..."

Many others entered queries for information or connections, or general comments and recommendations, such as:

"The Jade Pagoda on University Avenue just above Grove. Real good cheap food. They had a little fire but that just livened things up. Try it!!"
Keywords: food restaurant eat chinese dine dinner chopsticks

/or/

"Would anyone who has made vinegar at home, please call Steve at 929-8507."

As a final example, the question "Where can I get decent bagels in the Bay area (Berkeley!)?" gathered the following responses:

1) There is a store called "Bagels" above Key Route St. in Albany 2) The Danish Bakery at University and Shattuck in Berkeley 3) If you call Michael at 845-4550 an ex-bagel baker can teach you how to make good bagels. 4) You can get fresh bagels at the House of Bagels, way out on Geary in SF.

In this dialogue about bagels, Community Memory helped connect one person with a favorite food ... and included an offer to teach the person how to make his own. The data base also included a wealth of messages about community social services, neighborhood organizing, ecology and the environment, education, clubs, causes, and crises.

The experiment showed that the public at large, without prior training, can use an electronic information exchange system to define and meet their own information needs. The expected fear of computers was not much present. Instead, most people said, "It's about time."

The old system ran on expensive, outdated equipment which could not support replication or expansion of the project, and the experiment was terminated in order to write better programs for newer, smaller, cheaper, more powerful machines.

VI. How We Plan to Build It.

The technical goals in the design of Community Memory are: to produce a cheap system; which can be expanded in small increments; which can work even when parts of it are broken; can be relied on not to lose much information when it does break; and when broken can be put back into service by people without a lot of training in electronics. The major components of the system will be cheap enough so that they can be purchased and controlled by community based groups; but can be interlinked with others to serve large populations.

Community Memory will accomplish this by being many levels of network. The smallest unit is the node. A node will normally be supported by three or more of the latest "microcomputers" with at least two of every important component. In case of malfunction, the node should be able to recover itself and be reactivated. If the staff of a node are unable to discover what is wrong themselves, more highly trained technical types at another node will attempt to run the node from their own system and diagnose the trouble. Only on rare occasions will it be necessary for a node and its users to sit around waiting for a repair person. It would be possible to have a small node built of only one of everything (which would save money), but such a node will have to maintain a good understanding with its users.

Neighboring nodes will be connected by phone lines or cable into mutual aid groups. They can share technical personnel and expensive equipment such as tape drives. To the user, all the nodes in a mutual aid group will seem as if they are a single system.

The next level of network is the region. All the mutual aid groups and loner nodes in a region or city would be interconnected over the phone lines in what is called a packet switching network. The connections themselves will be owned and maintained by some association of nodes in the region.

The regions will be interconnected using "Public Data Carriers" to create a national network. Since these lines are owned by corporations (Xerox, Bell Telephone), communicating between regions will be substantially more expensive than communicating within a region. Searching the system nationally is best done by first knowing where to look. This will be aided by the creation of resource guides, bibliographies, and by encouraging nodes to develop special specific subjects.

Like the network, the user software will develop incrementally. The initial pilot system will have facilities for simple keyword and menu assisted searches and basic screen editing. Then, experiments will be done with user participation to develop better means for entering, locating, and maintaining information. Tools will be added to allow the creating of bibliographies and other resource guides to the data base. Means will be provided so that entries can

be uniquely "signed" by their authors, to aid in determining the reliability of the information they contain. A simple language for writing user-interactive programs will be developed, so that people can participate widely in helping shape the system.

Currently, the software is being developed using the "C" language on Digital Equipment Corporation LSI-11s and Intel 8080 microcomputers. The "C" language was chosen to enable us to switch to faster and cheaper hardware as it becomes available without major rewriting of programs. We are using our own multi-cpu operating system called Provos, both for technical reasons and to keep the cost of buying software for a node as low as possible.

The new programs are currently nearing demonstration level, and (if we can find the money), a pilot node of Community Memory will be operating this year.

VII. Who We Are.

The Community Memory Project is a non-profit organization that works and makes decisions collectively. The work of rewriting the computer programs has been going on for several years, and is being carried out largely by volunteer staff and consultants. The core group of 12 includes the three original designers of the first incarnation of Community Memory, who have now worked together for over seven years.

For more information, write:

The Community Memory Project
916 Parker St.
Berkeley, California 94703

Appendix 5

Community Bulletin Board System

CBBS Networks

Community Bulletin Board Systems (CBBS)

(Revised 10/02/79)

This is a list of CBBS and similar message exchange systems.
The codes BPM to the right of the page represent various
system features. An X under a heading indicates the presence
of a feature. Also, a specific code may appear under a
heading. Here are the meaning of the specific codes:

B - Bulletin Board
   C = CBBS (Community Bulletin Board System - 8080 C)
   M = MINICBBS (must type MINICBBS after system says A>)
   A = ABBS (Apple Bulletin Board System)
   F = Forum/80 (TRS-80 under TRSDOS)
   D = ADGBS (Akron Digital Group Bulletin Board Syst)
        (Similar to CBBS - no CTL-C, CTL-K functions.)

P - Programs also available (code for operating system)
   C = Remote CP/M
   N = Remote Northstar
   A = Remote Apple DOS

M - Machine
   8 = Generic 8080
   6 = Generic 6800
   A = Apple
   T = TRS-80

These systems are all available for public use at no
charge. Please feel free to try them. Two or more carriage
returns are usually required on microcomputer systems -
carriage return, line feed on larger systems. Most are 300
baud, but some CBBS's allow 110, 300, 450 and 600.

STATE Name	Location	Number	B	P	M
CALIFORNIA					
Forum/80 Orange	Anaheim	714-991-3640	F		T
Apple Corps ABBS	Canoga Park	213-340-0135	A		A
	Fresno	209-638-6392			
Hawthorne ABBS	Hawthorne	213-675-8803	A		A
Korsmeyer ABBS	Huntington Bch	714-962-7979	A		A
Has 10 M-byte hard disk					
Computer World ABBS	Irvine	714-751-1422	A		A
CCI Southbay ABBS	Lawndale	213-370-3160	A		A
Hours 8PM - 8AM M-S All day Sun					
ABBS/Long Beach	Long Beach	213-428-4718	A		
ABBS/Marina Del Rey	Marina Del Rey	213-821-7369	A		A
CBBS/Pasadena	Pasadena	213-795-3788	C		8
Comp. Merchant ABBS	San Diego	714-582-9557	A		A
ABBS/PCNET	San Francisco	415-948-1474	A		A
Operated by the PCNET committee					
Forum/80 SF	San Francisco	415-348-2139	F		T
ABBS/Computer Store	Santa Monica	213-394-1505	A		A
Hours (PST) 8PM-10AM Tue-Sat All day Sun-Mon					
People's ABBS	Santee	714-449-5689	A	A	A
Almost all national activity - system hacker types					
Peripherals, Unltd.	Signal Hill	213-424-3506	A		
ABBS/CCI	Westminster	714-898-1984	A		
DISTRICT OF COLUMBIA					
AMRAD	Washington	703-281-2125	X		6
Amateur radio operators, with an on-the air link					

```
FLORIDA
A.C.E.S. ABBS          Ft. Lauderdale 305-566-0805  A   A
ABBS/Miami             Miami          305-821-7401  A   A
Forum/80 Tampa         Tampa          813-223-7688  F   T
ABBS/W. Plm Bch        W. Palm Beach  305-689-3234  A   A


GEORGIA
Computerland ABBS      Atlanta        404-953-0723  A   A
Microstuff, Inc.       Atlanta        404-939-1520     N
                       Atlanta        404-325-0526      C 8
CBBS/Atlanta           Atlanta        404-394-4220  C   8


ILLINOIS
CBBS/Ward & Randy's    Chicago        312-528-7141  C   8
Forum/80 Chicago       Chicago        312-925-0259  F   T
        Sends graphics to TRS-80's!


KANSAS
Engineer/80            Olathe         913-764-1520  F   T
        Messages concerning engineering applications
Forum/80 Wichita       Wichita        316-746-2078  F   T


MASSACHUSETTS
ABBS/Boston            Boston         617-354-4682  A   A
CBBS/Boston            Boston         617-963-8310  C   8
Forum/80 SBSG          Dunstable      617-649-7097  F   T
New England Comp Soc   Maynard        617-897-0346  X
        Running on a machine at DEC


MICHIGAN
CBBS/Computer Mart     Detroit        313-288-0335  C   8
SEMCO MISD             Macomb County  313-286-8820  X X
        Access code: HEL-R901,SEMCO
SEMCO WISD             Westland       313-326-6050  X X
 "  "  mux (300 baud)  Grosse Pointe  313-343-2375
 "  "  mux (110 baud)  Grosse Pointe  313-343-2370
        Access code: HEL-Z301,SEMCO
Remote CP/M            Royal Oak      313-588-7054  M C 8
        Ring once, hang up, call again. Second call answered.


MISSOURI
EMS                    Kansas City    816-737-1031  X   6
        Computerized conferencing experiments
Forum/80               Kansas City    816-861-7040  F   T
        8pm to 4pm weekdays - after 8pm weekends
Forum/80 St. Louis     Saint Louis    314-838-7784  F   T


NEVADA
Forum/80               Las Vegas      702-873-9112  F   T
        Not yet operational, coming soon.


NEW JERSEY
SJ Electrnc Mail Ctr   Bound Brook    201-457-0893  X   6
        Access code: HEL-I999,MAIL
Forum/80               Princeton      201-874-6833  F   T


NEW YORK
??? (Bob Iannucci)     Endicott       607-754-5571  X   8
        Interesting CBBS variant with new features
ABBS/NY                Staten Island  212-448-6576  A   A


OHIO
Akron Digital Group    Akron          216-745-7855  D   8


OREGON
CBBS/NW                Beaverton      503-646-5510  C   8
```

SOUTH CAROLINA
```
Compusystems            Columbia          803-771-0922      X
    "RSTS-80" - Northstar - programs only
```

TENNESSEE
```
Computerlab ABBS        Memphis           901-761-4743  A   A
        Hours M-F 6PM=9AM Sat 6PM to Mon 7AM
Forum/80 Memphis        Memphis           901-276-8196  F   T
        Has conference on handicapped applications
```

TEXAS
```
CBBS/Dallas             Dallas            214-641-8759  X
Forum/80 Fort Worth     Fort Worth        817-923-0009  F   T
ABBS/Houston            Houston           713-977-7019  A   A
        6:30 PM to 8:00 AM M-F  5:00 PM Sat to 8:00 AM Mon
Appleseed ABBS          San Antonio       512-657-0779  A   A
Texhoma Micro Enth      Wichita Falls     817-855-3916  F   T
```

VIRGINIA
```
Family Hist. Forum      Fairfax           703-978-7561  F   T
        "Electronic newsletter" on genealogy
```

WASHINGTON
```
Apple Crate ABBS        Seattle           206-524-0203  A   A
```

APPENDIX 6

<u>List of Interviews</u>

List of Interviews

1. **Networks & Systems**   EIES
    I.P. Sharp Associates (MAILBOX)
    Infomedia Inc.
    Canada Systems Group and Computer
      Corporation of America (COMET)
    Bell Canada - Bell Northern Research (COCOS)
    Multiple Access Group
    Comshare Ltd
    Company "A"
    QL Systems Ltd
    HERMES
    AES Data Ltd
    Hewlett-Packard Ltd (COMSYS)
    Company "B"
    Shirley Bay Research Centre (DOC)
    Non Medical Use of Drugs (NMUD)
    Canada Geoscience Centre (EMR)
    SAM'S CLUB
    THE SOURCE
    Community Memory
    DEAFNET
    Community Bulletin Board Systems (CBBS)
    Radio-Packet

2. **Electronic Information Exhange System** (EIES)
    John Senders, University of California, Santa
      Barbara, CA
    Joe Martino, University of Dayton, Dayton, Ohio
    Charlton Price, University of Puget Sound,
      Puget Sound
    Mike Hill, Mike Meccia, General Telephone Co.
      of Indiana, Fort Wayne, Ind.
    Walter Cote, Air Development Centre, Rome, N.Y.
    Norman Bryant, Dept. of the Army, Washington, D.C.

Mason Rumney, consultant, Arlington, Va

Sandy Emerson, social animator, San Franscisco, CA

Don Selwyn, National Institute for Rehabilitation
   Engineering, Butler, N.J.

George Tracz, Ontario Institute for Studies
   in Education, Toronto, Ontario

Jane McCarroll, Innovative Systems Research, Inc
   Cleveland, Ohio

Mike Heines and Ron Heroux, New England Innovation
   Group, Providence, R.I.

 Dan Davis, New Era Technolgies, Washington,
   D. C.

Barry Wellman, University of Toronto, Toronto, Ont.

Roger Caldwell, University of Arizona, Tucson, Az

Douglas Cayne, Hudson Institute, Sandy Hook,
   CT, and Mountain View, Calif

John Carey, New York University, New York, N.Y.

Jeanne Guillaume, librarian, New College,
   Toronto, Ont

Stewart Bainbridge, University of Ottawa, Ottawa, Ont

Earl Flowers, Flow General Inc, Petaluma, Cal
   and McLean, Virginia

Patrick Foley, University of Toronto, Toronto, Ont

Victor Rodriguez, consultant, Washington, D.C.

Vern Ekstrom, Legislative Council staff,
   Oklahoma City, OK

David Culver, Participative Systems, Inc.
   New York, N.Y.

Karen Paulsell, student, NYU Alternate Media Centre,
   New York, N.Y.

Ron Levy, University of Montreal, Montreal, Que

Richard Copeland, Bethune-Cookman College,
   Daytona Beach, FL

Philip Drinker, Peter Bent Brigham Hospital
   Boston, Mass

Zavis Zeman, Institute for Research on Public
   Policy, Montreal, P.Q.

Appendix 7

Terminals in the Home

Appendix 7

Terminals in the Home

In the course of the survey of EIES members a number
of comments were received during telephone interviews
which provided insight into people's feelings and
reactions about the use of a computer terminal in the
home.

- wife thinks it will wear the phone out
- nobody else can use the phone
- terminal in the bedroom, but no problem
- family stressed at first, but then adjusts
- wife asks if he prefers the terminal in bed
- one user in Washington contacts her psychia-
  trist in California
- "my wife is a very understanding individual"
- youngsters (8, 12, 15) have their own computer
  and comments are often heard, e.g. "Hey Dad,
  come and see this!"

There was an illuminating discussion of the impact of
computer terminals in the home in the EIES conference
"Impacts" C1003, CC99 to 120.

The discussion began with the raising of a number of
relevant questions.

- Should all family members have equal access
  to a terminal?
- Should family memberships be established in
  lieu of individual memberships,
- To what extent do parents have the right to
  regulate and monitor their children's use of
  a terminal?
- What effect would extended family usage have
  on the roles of individual members?

The discussion then continued:

A single parent found that there was a kind of sibling rivalry between the son and her terminal. The problem was eased by getting some computer based games so there was some direct involvement.

One observed that for those who have not previously worked at home, whether they be business executives, professors or typists, the family for the first time becomes exposed to a new network, that may seen alien to accepted patterns.

The possibility of the family needing several terminals was raised, particularly if the programs available were as interesting to the young people as they are to EIES users.

One pair of subscribers to EIES spend nearly every 24 hours together, working at home as consultants on computer terminals, sharing both the household duties and the computer activities. A fifth-grade visiting relative participated in terminal activity with games, Christmas letter to Santa, and exploring the potential of messaging making new friends.

A member felt that if computer terminals could provide more than just games for the children, then the demand for a second family terminal could become quite strong.

Finally, several people felt that computer terminals in the home would not strengthen family relationships.

It looks therefore as if the impact of the terminal in the home could be quite strong, as it often is with T.V.

Appendix 8

List of References

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List of References

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2) Starr Roxanne Hiltz, and Murray Turoff, "The Network Nation", Addison-Wesley, Don Mills, Ontario 1978.

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9) see BYTE - November 1978, p. 150-157.

10) Murray Turoff, "The EIES Experience" Bulletin of
    the American Society for Information Science,
    Vol. 5, No. 5 (June) 1978.

11) Alphonse Chaponis, "Interactive Human Communication",
    Scientific American, March 1975.

12) Thompson, Gordon B., "Memo from Mercury", Institute
    for Research in Public Policy, Montreal, 1979.