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Electronic Mail and Human Evolution or Electronic Steam Roller

Maybe this is
a book - not an essay

1982
VIEWS OF
COMPUTER
NETWORKING

Refs

- Ethernet
- ARPANET
- "VM NET"
- Source
- COMPUSOURCE
- Knowledge Indep

Refs

Cybernetics
being a cell
Hum cept hum b.
etc

Cyber Jack Force Report

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This viewpoint was written between 1982 and 1986 by DJF

WHAT ARE ELECTRONIC MAIL AND NETWORKING ?

"Electronic Mail" is using computers instead of the post office. This means sending and receiving messages among people who share access to computers which in turn are interconnected on a network of telephone or satellite communication lines.

"Networking" is used by some people to refer to the use of certain new and unique attributes of electronic mail which are not present in any other form of human communication. These attributes and their implications for human evolution are introduced and speculated upon in this essay.

The most significant of these attributes involve

- Very significant increases in speed and breadth of search for information.
- Unique serendipitous discovery of information or ideas.
- New search technique - content-driven inquiry.
- New styles of human interaction are developed

Conversations by electronic mail, or networking may occur between two or among many people who may be anywhere where a electric power, a computer, and telephone lines are available.

People may be sending and reading responses at approximately the same time, or they may send messages to a recipient's computer where they are saved until the recipient "signs on" to his/her computer and "reads his/her mail".

To those already familiar with networking this subject is not news. This essay is for others who are unfamiliar with electronic mail and its implications for communication and human evolution.

WHAT IS SO EXCITING ABOUT THIS ?

Implications for human development - to be explored below under the guise of placing this stuff in the context of the history of development of language, communication, and information storage and retrieval, and the implications for human development of advances in this area.

ELECTRONIC EXCITEMENT

just a fast post office

taking advantage of very fast post office

NETWORK NEUROSIS

taking advantage of looseness of organization of participants

taking advantage of ability to seek and organize information

Anxiety caused by this new communication medium

- for formal organizations
- for individuals

to be dealt with more extensively below under the Electronic Witch Hunt

HOW HAS THIS HAPPENED ?

To those who have not been working behind the scenes for years there seems to be a sudden explosion of communication among people by means of computers and computer networks. The people using computer networks to ask one another for information or to exchange ideas have in common -

- ready access to a computer terminal, a computer, and an online network.
- sufficient familiarity with computers to be able to use "commands" and "node" and "user id" (name and address) to send queries/messages.

Intended originally for sending large data files, today many computer networks carry a growing volume of short messages between individual data processing professionals. These messages are usually technical questions, requests for data, or technical debates concerning solutions to problems. Occasionally personal non-technical discussions go on as well, serving to strengthen "computer friendships" which are often formed between people who may have never met in person.

In the late 1970's or early 1980's, and almost without notice the number of people communicating with one another by means of computer networks reached "critical mass". At this point, sufficient computer resources were readily available so as to permit a sufficiently wide audience of participants that the number of people of various technical specialties who were "available" on various networks became large. Large enough that this body of people became recognized (by its members) as a very valuable resource useful for solving technical problems by consultation among its members.

PLACING ELECTRONIC MAIL IN HISTORY

Electronic mail is perhaps the most significant development in human evolution since the invention of the printing press.

A unique human attribute which has been described as one which sets us apart from other animals is our ability to accumulate and pass on experience, and to share that information. Other animals communicate and may have rudimentary languages. There is little evidence of the accumulation and passing on of information with other animals except at the genetic level. While a rich codification, genes seem pretty well occupied with preservation of basic biological data necessary for physical development.

2/14/85

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 but have to consid what's unique about
 us - our abil (of other animals)
 stored + accumulated
 outside of our brains -
 - stones
 - written lang
 - manuscripts

prints press
 - libraries
 - periodicals

(modern media)
 → data base
 → networks

→ Rec'd data base
 → libraries
 → periodicals
 → news networks
 w/ new chans of search, Spill, Super

as speed of comm

TRACING THE DEVELOPMENT OF ACCUMULATION OF KNOWLEDGE

PREHISTORIC TIMES

12000 BC

EARLIEST LANGUAGE

Language enabled the earliest humans to cooperate. This cooperation had survival value.

STONEHENGE - EARLY EVIDENCE OF ACCUMULATION

Prior to 2000 BC we have no evidence that knowledge was passed on from generation to generation by means other

1900 - 1600 BC.

The Aubrey holes used to count a 52 year lunar cycle provided useful information for predicting the summer and winter equinox, certain eclipses, and thus offered a combination of power to the predictors and provisions to the planters. 52 years was longer than human lifespan at that time. These chalk holes, then, along with some verbal instructions are one example of an effort to find a means to pass on information across generations by means other than human memory alone.

WRITTEN LANGUAGE

Knowledge became easy to preserve for future generations. At this point it became possible for there to be significant accumulation of knowledge in amounts which exceeded capacity of human memory.

DEVELOPMENT OF THE PRINTING PRESS

Knowledge could be disseminated to a very much broader population, spurring interchange of ideas and the ensuing sophistication which is the product of more minds.

Still, initiative by the researcher sets limits on what will be discovered and shared across disciplines.

*As req for Preskner -
eg moveable type*

DEVELOPMENT OF COMPUTERS AND ELECTRONIC MAIL

Why might this be the next step in our evolution equivalent in impact to development of the printing press ?

GENETICS AND LANGUAGE

The gene pool is used to collect and pass on basic information needed for physical development and survival. Genetic research supports modern theory of evolution: It is the occasional insertion of random change in the gene pool which has permitted the adaptability of human and other organisms to change in our environment. Cultural taboos against incest and intermarriage probably spring from a recognition (by our biological system, not by us individually nor cognitively) that this infusing with variation is very important for survival/

Now notice a parallel in the production, use, and sharing of cognitive information: This randomness is necessary for healthy and synergistic interplay and discovery in intellectual searches as well. Just moments ago in our evolution the accumulated body of knowledge, especially technical knowledge, was small enough that major contributions to science were often made by generalists or by people who were able to become well informed in several major disciplines. The last well known example in modern times might be Von Neumann who studied, for example, psychology... As the production of detailed technical information has become rapid and its volume great, it has become almost impossible for people to develop real interdisciplinary skills.

It is indeed important for us to have specialists. It is the specialist who pushes on the frontiers of knowledge in his/her field.

Technical specialization is a two edged sword. It provides intensity of knowledge which permits close examination of the frontiers of knowledge. The development of formalized disciplines with rigidly organized information also pay the price of incest.

Enter the computer and electronic mail:

Information can be organized from diverse sources - just as we like to do with formalized disciplines. But at the same time, it becomes possible to search and correlate across much broader ranges of information than is feasible by a human using manual techniques or by slow reading research.

It provides very fast response to problems. Faster than what would be slow or never by use of only traditional means of seeking information.

It permits search of disorganized scattered information based on content driven and interest driven inquiry. (Analogous to an atomic reaction)

KEY: The content/interest driven routing of information is the direct analog in information retrieval to the survival value of random gene data introduction in biology.

This is the magic. This synergy the lure which draws people into the network.

ELECTRONIC WITCH HUNT

The sudden availability of networks which permit relatively instant communication between individuals and large numbers of professionals around the world has become a source of concern to managers in some companies. There was a normal reaction by management to what seemed a possible loss of control of their business.

Electronic mail represents significant advances in the ability for information distribution, similar to advances that resulted from the invention of the printing press. Such advances create two problems. Normally, control of information distribution represents a type of power or control. Significant changes in the technology of information distribution can cause significant disruption of existing power/control structures. The other problem is that major evolutionary changes are viewed with great fear by the majority of the people who don't understand what is happening and/or don't understand the new technology. All sorts of disastrous results were predicted as consequences of the printing press creating easily accessible information for the masses.

If it is possible for anyone to quickly reach others around a company without using either official corporate-approved communications paths or more traditional paths (such as the telephone or letters) which tend to naturally limit the rate and scope of dissemination of information, then what was to prevent some rabble rouser from stirring up trouble or some thoughtless or malicious employee from revealing secret technical information.

These are serious concerns. What has kept companies from simply shutting down these networks has been the recognition that the cost in reduced efficiency and poorer quality would be very high indeed. More work on controls, etiquette, and procedures is necessary.

Sometimes out of concern born largely out of unfamiliarity with just what exactly is going on on the network, managers have talked of eliminating networking in their company.

This is not unlike the book burnings which occurred in the dark ages, and again in more recent times. In the 1940's the Nazis burned books. Today the "Moral Majority" burns rock and roll records at public bonfires. While such burnings are clear symbols of their beliefs, doubtless not even the burners themselves believe they are stopping the production of records - which will continue so long as there is public demand for them.

Most of these fears are not necessary. Ideas move and are shared based on their content. If a comment is interesting and valid it will survive and be noticed. If it is dull it is ignored. Untruths will perish due to lack of interest. Truthful insights will be cherished and will be shared whether we try to stop them or not.

ANALOGIES IN BIOLOGY, NEUROLOGY, AND BRAIN FUNCTION

No one here is suggesting that modern computers are like human brains. It is true, however, that the physical sciences and information science have developed their own vocabularies and disciplines both of which are useful for exploration of the other.

The creation of new conceptual constructs and their propagation through the scientific community normally occurs over a large number of years. By comparison to many other disciplines, computer technology is in its infancy and much of the terminology and concepts are borrowed.

There are going to be similarities and differences between how computers operate on information and how the human brain operates on information. The very process of comparing the differences will help advance the understanding how they individually operate. Both studies are extremely important though from the stand-point of computer technology. First, advances in the understanding of how computers handle information allows them to perform the operation more efficiently and thoroughly. The second point is potentially even more important. Knowing how the human brain obtains and operates on information should significantly effect the design of the man/machine interface (both in hardware and software). Such a potential will greatly increase the effectiveness for computers augmenting human intelligence.

BIOLOGY - GENETICS

NEUROLOGY

NEURAL FUNCTION AS A MODEL FOR MODERN NETWORKING.

BRAIN FUNCTION

ORGANIZATION AND RETRIEVAL OF INFORMATION IN THE HUMAN BRAIN:

CONCLUSIONS

THE ELECTRONIC STEAMROLLER

with kudos to wheeler, tandem, and Co-Evolution, and Apple
It is coming and it is unavoidable

APPENDICES

HOW DOES ELECTRONIC MAIL WORK

Much has been said about rules or perhaps etiquette for using networks. For example, it is possible to "broadcast" a message received from one person onwards to a very large number of recipients. When this is done without permission of the originator of the message it is considered unethical and would generally result in reluctance to communicate via the network with that offender again.

How do questions or technical information find their way around a computer network ?

Questions and information tend to be self directing. If you ask one person for information about the performance of disk storage devices that person may have some information or may simply have an idea who does know more. With permission the original target of your question may pass it on to whom he considers a better source. That person may do likewise, while sending you some references in the mean time.

If a professional set out to search for information by conventional means he/she would probably consult a technical library, find subject references, and possibly begin to request copies of technical articles or documents for further study.

Electronic mail is not a substitute for that research. But while conventional research would likely turn up the names of key professionals in a field, and yield formal documentation, it has the following attributes:

- Production of reference information depends on initiative of the individual researcher and the items produced are the direct result of the ordered or unordered discipline of that single individual. If the researcher can miss a key reference simply by failing to read the last page of a particular article.
- Only information which matured into form of written articles will be found easily.
- Without personal contact with each professional currently working in the field it is difficult to obtain the most recent thoughts or opinions, or to share them.

This means that opinions must mature in a rather narrow confine before they are formalized in written form.

By contrast, electronic mail has some different attributes:

- Once the individual researcher has launched a question to one or several professionals on a network, a large number of people can, at minimal effort, provide additional information, either by responding to the query or by sending it onwards to someone who may have useful information about it.
- Information concerning current research activities is readily available in form of informal comments which have not matured into formal published form.
- Technical idea regarding a particular subject can mature with the synergistic benefit of commentary from a very broad technical community. The implication is that the results ought to be of better quality because there were more opportunities for people to question the idea during its formulation than exist in systems which rely on formalized printed word.

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INDIVIDUAL USER "ACCOUNTS" ON LARGE COMPUTERS

PERSONAL COMPUTERS

NAME AND ADDRESS FILES

COMPUTER PROGRAMS TO SEND AND RECEIVE FILES

TELEPHONE/SATELLITE CONNECTIONS

PRIVATE AND PUBLIC NETWORKS

REFERENCES

1. CO Evolution Quarterly
- 2.

 This is a sample file of electronic mail shared among contributors
 to writing of "The Electronic Steamroller".
 Other mail traffic occurred during this period but has been
 deleted from the file, not as censorship, but for brevity. A few
 examples of other simultaneous conversations remain.
 The reader will notice the interwoven threads of conversation as time
 progresses from the top of the file downwards.

To: WHEELER at SJRLVM1 10/04/82 09:04:11
 From: FRIEDMAN at PKEDVM7 914-463/8-253 -3027 E86/705-1U11

Thank you for files which I will read later this am.
 The mvs3 and the like which I keep seeing,
 as long as you continue to serve as a change agent you will be unpopular
 with
 many people - mgrs and technicians and even turkeys, all three groups
 having
 a strong feeling they have lots to lose when the status quo and modus operandi
 are
 threatened.

Students of organizational behaviour and social change too hasten to point
 out that the only real progress made in organizations comes from agents of
 change. They would add that such agents are never widely appreciated.
 History

is replete with examples which prove the point.

My mgt has asked me to write something !! amazing since generally I am
 asked to shut the hell up. I am asked to write just what I want to go on
 in attempting to reconcile my continued employment here with management
 discomfort with my existence. (my words and perhaps a bit of my
 interpretation).

In the context of above cmt about unpopularity of change agents, and
 finding
 myself cast as one with no conscious effort on my part, I have some
 questions
 to think about myself.

I started the response, but am holding it for more thought. Over a car
 trip
 on Fri I thought about your cmt about how the organization fears electronic
 mail. I outlined an essay on the electronic steamroller. Therein is not a
 single new thought, not a phrase which has not already appeared in one
 place
 or another. But I will probably fill in some words around the outline
 anyway and let some people look it over. Purpose? Maybe to increase
 their
 understanding of what is coming. Who knows, among the frightened masses
 work supporters of the future?

 To: WHEELER at SJRLVM1 10/04/82 10:22:35
 From: FRIEDMAN at PKEDVM7 914-463/8-253 -3027 E86/705-1U11

I forgot to mention that a certain recipient ignored the header on swansong
 which requested that it not be redistributed without permission from the
 author. He made copies and passed them on to my mgt chain for their
 entertainment. I intended the memo for them anyway, though I wanted to

lish it first by getting some opinions from some people i respect.
 ignoring my request this person committed what I consider severe
 each of ethics. I am sad to think that my normal assumption that I can
 ve implicit trust in all my coworkers was a bad assumption.

MSG To: FRIEDMAN at PKEDVM7 10/04/82 11:31:12
 From: RESTIFO at PKEDVM7 T.HENDRICKS

Note: I have been gathering a bunch of info regarding the different patch
 strategies, and will try to summerize it by end of Tuesday. So, please wait
 before formulating any recommendations. OK with your schedules?

To: RESTIFO at PKEDVM7 10/04/82 12:50:19
 From: FRIEDMAN at PKEDVM7 914-463/8-253 -3027 E86/705-1U11

MSG To: FRIEDMAN at PKEDVM7 DAN 10/05/82 10:14:49
 From: WFK390 at PKMFGVM WALT KUNZ 000

Dan, did you get the copy of my Autotest IPS? Can we get together
 today or tomorrow to discuss it?

MSG To: FRIEDMAN at PKEDVM7 DAN 10/05/82 10:35:39
 From: WFK390 at PKMFGVM WALT KUNZ 000

I gave it to Nancy Haines Friday to put in your mail. Tomorrow
 sounds good.

MSG 0007 10/05/82--08:53:07 + To: PKEDVM7 FRIEDMAN From: SJRLVM1 SCHWADER
 ADDRESS: IBM Dept K52 Bld 28-2
 5600 Cottle Road; San Jose, Cal. 95193
 TELEPHONE: (408) 256-1807 TIE 8-276-1807

Dan, thanks for the note. I appreciate your passing the paper to Jim.
 You may wish let let him know that I want to talk to him regarding it, and
 that I was introduced to him by Cynthia Wolf at an internal MVS class in
 Pok. That was about six years ago. Thanks.

* Dave Schwaderer
 * SJRLVM1 SCHWADER

To: WHEELER at SJRLVM1 10/05/82 15:26:33
 From: FRIEDMAN at PKEDVM7 914-463/8-253 -3027 E86/705-1U11

I am sending my electronic steamroller file to and only to you and dave
 schwaderer. It is in extremely rough shape.
 but it collects some of the thots I am working on.
 If interested you could make me happy by chopping on it with me.

To: LICHTMAN at PKEDVM7 10/05/82 15:41:32
 From: FRIEDMAN at PKEDVM7 914-463/8-253 -3027 E86/705-1U11

For your resources problem, note that retain ursf people

expect to be able to create test cases, patches, and other who knows what
and write it onto the local customers pc dasd. we had better plan a
it carefully for just how many different people all think they are using
the same free scratch area.

MSG 0009 10/05/82--14:48:03 + To: PKEDVM7 FRIEDMAN From: SJRLVM1 SCHWADER
ADDRESS: IBM Dept K52 Bld 28-2
5600 Cottle Road; San Jose, Cal. 95193
TELEPHONE: (408) 256-1807 TIE 8-276-1807

Geeze.....was that awful.

Well not bad at all really.... you should send a copy to Bert Moldow and
perhaps read the NETWORK NATION book. Also run the spelling checker
on the text when you get a chance.

I have long maintained that people are on the same "thought frequency"
when engaged in electronic mail. All the irrelevant sensory distractions
are removed.

Keep me on the list.....

*
*

Dave Schwaderer
SJRLVM1 SCHWADER

To: SCHWADER at SJRLVM1 10/06/82 10:57:33
From: FRIEDMAN at PKEDVM7 914-463/8-253 -3027 E86/705-1U11

the way i begin stuff sometimes is to just dump some thoughts into a file
then go back and sort em out. you got the dumped version.