PERSONAL COMPUTING: A GLIMPSE INTO THE FUTURE

Mary Stevens
Assistant Director
Library Systems
York University Libraries

ABSTRACT

The technology now exists to put information and communication networks to work in the service of the individual who has information and communication needs. Personal computing puts hardware, software, storage and communication facilities at the disposal of the individual. It will have profound effects on the way in which people seek, find, use and communicate information.

For decades men and women of vision have dreamed of information networks as extensions to the mental and nervous faculties of human kind. Personal computing offers the means of fulfilling this dream by providing the links, through space and time, between the individual's personal information system and the worldwide information/communication resources network.

Personal computing is a grassroots phenomenon which, in its most exciting aspects, involves communication among people of all ages and all walks of life. Children learn personal computing at home, at school (though not necessarily in the school library) and in the street. Access to personal computers will need to be provided to those who don't have access in their homes or places of work. Expert guidance will need to be provided to people in their use of personal computing as extensions of themselves. These things will happen whether we as librarians and information specialists get involved or not.

L'INFORMATIQUE A DOMICILE: UN REGARD DANS LE FUTUR

RESUME

La technologie existe maintenant pour permettre aux réseaux d'information et de communication de travailler au service de l'individu qui en besoin. L'informatique à domicile donne à chaque individu l'accès à l'ordinateur, à la programmation, l'entreposage des données et à la communication. Ceci aura des effets marqués sur

la façon dont les gens cherchent, trouvent, utilisent et communiquent l'information. Ceci offre aussi les moyens pour réaliser le rêve d'avoir des réseaux d'information entre un système d'information d'un individu et le réseau mondial d'information et des ressources en communication.

Les directives d'experts seront nécessaires aux gens pour leur usage personnel de l'informatique comme un outil extensif. Ces événements vont avoir lieu que les bibliothécaires et les spécialistes de l'information s'impliquent ou pas.

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When I was asked to talk about personal computers in today's proceedings, I said no, but I'd be happy to talk about personal computing. Last year I was asked to teach a course at York University on personal computers. I agreed on condition that the name of the course be changed to personal computing. Why do I feel so strongly about this? Is there any real difference between personal computers and personal computing? Is there any real difference between sailboats and sailing, or airplanes and flying? A personal computer -- or any other kind for that matter -- is a collection of hardware; it is inanimate, dead. Personal computing is an activity -- a personal activity; an extension of oneself.

One thing that helped to bring this lesson home to me was the experience of building a personal computer. To be honest, I only helped to build it, or rather to assemble it from a kit. Although it was not planned that way it was, as it happened, a family Mississauga train derailment project. As a matter of fact, we assembled it from a kit. We assembled it partly to save money and partly, on my part at least, with some naive expectation that I would learn more about computers. What I learned, mostly, was how to follow instructions and how to pick little bits and pieces out of little bags and boxes. Had I not already known it, the experience would have demonstrated that a computer, even a small personal one, is made out of thousands of little pieces of hardware. A side benefit was a lasting community of interest with others who have shared the experience.

After it was fully assembled and all checked out, and the inevitable assembly errors and solder bridges were tracked down and rectified, we turned on the power. The screen lit up and, to two pairs of bleary eyes, it wasn't too difficult to imagine that the computer, whose power-on prompt is "H:", was saying "Hi!". This is about all the intelligence, or friendliness if you have a vivid imagination, that is built into the Heath H89's ROM (Read Only Memory) -- a kind of software built into hardware. What really brings this dead thing to life is software, in the form of the computer's operating system, programs written by other people, and programs written by ourselves. One of the first things we added was a dial-up modem, and the more we use our personal computer the more we find that some of the most interesting things we use it for involve communication.

Personal computing (as opposed to personal computers) brings together hardware, software and communication to serve personally meaningful ends. This is not to say that hardware is not important, or that it does not matter what kind of computer you buy (or build). I would suggest that you assemble your own only if you want to save money or you love soldering and looking for little bits and pieces in little bags and boxes. You should choose carefully because, as anyone who has ever used more than one computer knows, every computer has its own personality. What gives it personality is the mesh between its architecture (hardware) and its operating software.

Although you should choose carefully, you shouldn't take too long about it, because the temptation to wait for something better will always be there. If you are ever going to get started you will have to plunge in knowing that what your order today will be obsolete by the time you get it, and that by this time next year you will be able to get twice the computer for half the price.

Do start with something with capacity for growth. We thought we started high with 48K (48,000 characters) of internal memory and one floppy disk drive with a capacity for over 100,000 characters of disk storage to be online at any one time. We have since added 16K of internal storage and an additional disk drive as well as the modem and a dot matrix printer; all, except the modem, assembled by ourselves. There is plenty of capacity for expanded disk storage, with up to four drives, dual sided, double density, larger (8-inch) and "hard" disks available. All it takes is money. With the cost of disk storage declining by about half every two and a half years, it takes less money all the time. We sometimes think the computer is the loss leader for the floppy disks, of which we now have over 100 -- all full. Something related to Parkinson's Law insures an infinite capacity for filling up disk space.

When people ask what we use our computer for, I hardly know where to begin. Only lack of time prevents us from using it for more. My husband and I both work full time, we are both students and we both teach. We use our personal computer in all of these capacities and more, for such diverse things as cataloguing books (in MARC format, of course), organizing collections, developing and testing the logic for programs that will later be written in other languages to run on other machines, managing projects, planning a conference, writing a newsletter, keeping track of our personal finances, preparing assignments and hand-outs, modeling and forecasting, statistical analysis, playing games, consulting and being consulted, exchanging software, communicating with people as far away as Hawaii and Alaska, browsing online catalogues, and exploring "The Source". (More about this later.) We use it a great deal for word processing. We have, among our collection of purchased software, a genealogical package called "Roots". If we ever find time we'll use it to record our family trees.

We use it as much as anything as a terminal -- but a terminal with an important difference. With sophisticated modem communications software now generally available for a few dollars, a personal computer offers all of the features of an intelligent terminal with the important addition of memory and the capacity to transfer programs and/or data in either direction between the personal computer and the "main frame" with which it is communicating. Among other things, this makes distributed processing possible. It makes it possible to do locally what can best and most cheaply be done locally and to use central computers only for what can best and least expensively be done centrally.

"The Source" describes itself as an "information utility". Born, perhaps prematurely, in McLean, Virginia, it grew up too fast. The Source Telecomputing Corporation is now a subsidiary of The Reader's Digest Association. Anyone can open an account for a one-time charge of $100. There was a time when use of this poor man's information utility in non-prime time cost $2.75 an hour. Those days are gone and it now costs $7.50 an hour in Canada in non-prime time. This may seem like a lot to pay for an all-too-imperfect glimpse into the future, but what else can an old married couple do on a Saturday night for $7.50 an hour that is not either habit-forming or fattening? Besides, it is not really money, because you pay for it with plastic.

Exploring "The Source" is fraught with surprises, like finding mail from some stranger or being interrupted by someone from California (or Alaska or Hawaii) who invites you to chat. There is no way to stop electronic junk mail, but there is an etiquette attached to "chatting" and it is possible, if you have more important things to do, to set your computer-cum-terminal to "refuse chat".

For those who have not used a utility like "The Source", perhaps the best indication I can give of the immediacy of the experience is to describe an incident that occurred when I was demonstrating "The Source" to my first-year class in personal computing. It happened to be Memorial Day in the U.S. and hence a non-prime-time day. A group of students were "chatting" to a young programmer from Chicago on a busman's holiday. Although the students had initiated the conversation the young man seemed to have an immediate grasp of the situation, even to the point of getting in a few well-aimed digs at the teacher. When it came time to bring the conversation to an end he said goodbye with a flourish of control-G's. (A control-G rings the terminal's bell.) By his spontaneous gesture of pressing a key on his terminal in Chicago and ringing a bell in a classroom at York University, this young man did more to bring home the object of the lesson than anything I as a teacher could have said or done.

Like the elephant to the blind man, "The Source" is many different things to different people. Operating through Datapac in Canada and Telenet or Tymnet in the U.S., it offers an

ever-increasing range of communication and information services such as bulletin boards, news and financial services, catalogue shopping, education and career services, leisure time and entertainment activities, news and sports (UPI and The New York Times), science and technology, statistical, mathematical and engineering programs, travel service, air schedules, restaurant and wine guides, movie and book reviews, data processing and data base management services. There is an active U.S. library interest group. For a time there was an experimental tie-in with OCLC.

I don't claim to be a sophisticated user of "The Source" and I can't get very excited about most of what it has to offer me personally at this point in time. I see it as a harbinger of much more important things to come and as something that I in my chosen career have no choice but to be part of.

What has all this to do with the theme of this Conference? Much has been said about the information society. John Tyson, in a recent Financial Post "Special Report on Computers" wrote, "I . . . challenge the assertion we are moving from 'the industrial society to the information society.' We are moving from the industrial society to the communications society. Information and communication are not the same. Information consists of hard facts. Communication implies transmission, interaction, transaction, translation, integration, relevance and intimacy".[1]

For decades men and women of vision have dreamed of extensions to the mental and nervous faculties of human kind. In 1948 Professor Norbert Wiener of M.I.T. introduced the concept of feedback in his book "Cybernetics: or control and communication in the animal and the machine". The book contains a chapter on computing machines and the nervous system.[2] The final chapter discusses communal or group information.[3]

In 1945 an article by Vannevar Bush entitled "As we may think" appeared in The Atlantic Monthly. In it he described a machine he called "memex", a personal library in microform which is also an extension of man -- "an enlarged intimate supplement to his memory".[4]

Calvin Mooers received an award of merit from the American Society for Information Science in 1978 for, among other things, predicting that machines would simulate thought processes. He was first to propose the use of Boolean operators for information retrieval, a term he coined in the 1940's. In 1960 Mooers predicted an automated information centre that would serve as both a retrieval and a teaching device, with two-way feedback between the individual and the information store.[5]

In 1962, in an article entitled "Where will the books go?", John Radar Platt wrote in Horizon of a microlibrary that was an extension of man in the form of a universal brain. "In our use of it we can therefore begin to approach the unity and directness of our own

complex biological decision-making and memory system, with its similarly interrelated and microscopic neuron elements . . . Microlibraries would be a memory and the beginnings of a universal brain for the whole human race".[6]

In 1965 J.C.R. Licklider used the words "man-computer symbiosis" and called the library of the future a "pro-cognitive system" and an "adaptive self-organizing system".[7]

Marshall McLuhan was the first to gain widespread acceptance of the idea of media as extensions of man. "Our new electronic technology now extends the instant processing of knowledge by interrelation that has long occurred within our central nervous system".[8]

The visions of these people, and others like them, have not yet been realized. Personal computing offers the potential of fulfilling these dreams by providing both an extension to the individual's personal information system, and the link between the personal information system and the wider information and communications network. Personal computers will be regarded as standard equipment in library study carrels. With appropriate communication facilities scholars and others will use the personal computer to browse the library's online catalogue of other libraries; to seek, verify and initiate requests for their own interlibrary loans; to search and retrieve information from online data bases (yes, without the intermediary of a librarian); to communicate with other scholars in the invisible college; to communicate with professors and advisors; to process words and to "publish" electronically; to crunch numbers and analyze data; and to explore vastly improved versions of "The Source".

Personal computing is now finding an important place in public libraries, in schools (though not necessarily in school libraries) and in homes. Children learn personal computing in these environments and on the street (or its suburban equivalent,, the shopping plaza), where every computer store has its resident kids who start out playing computer games and soon graduate to computer programming on-the-fly. Students who are used to finding and using personal computers in these environments will expect to find them in libraries. As standard equipment in carrels and offices, personal computers will provide for the transfer and storage of information, assist in literature searches and the preparation of bibliographies, provide mailboxes and bulletin boards for communication with instructors and other students, provide word processing and number crunching services and electronic facilities for storing, manipulating, communicating and publication of theses, correspondence and scholarly papers.

Libraries and information centres, if they rise to the challenge, will provide personal computers for the use of those who do not have access to them in their homes or places of work. These

people will need expert guidance in the use of personal computers to find and process information. If we are not prepared to provide it, someone else will, and we will find ourselves on the outside looking in. Libraries may "wither away", or they may become vital places in which librarians and information specialists confidently and proficiently help to put information and communication networks to work in the service of the individual who has information needs. Personal computing is the link that will permit the whole technological apparatus to serve as an extension to the mental and nervous systems of men, women and children interacting with others and with the accumulated art and wisdom of the human race, past and present. Personal computing provides the interface to make all the other information technologies truly "extensions of man".

The theme of this Conference is "Information: the ultimate employer". Personal computing -- and by that I mean not just hardware but the happy juxtaposition of hardware, software, storage and, most important of all, communication -- is now having profound effects on the way individuals seek, find, use and communicate information. If we as librarians and information specialists expect to lay claim to information as our ultimate employer, we owe it both to ourselves and to the information consumer to get involved as soon and as much as time and money permit in using personal computing as extensions of ourselves.

REFERENCES

1. Tyson, John, "Trying to come to grips with a 'terminal' affliction, The Financial Post, special report on computers, February 27, 1982, p. s13.

2. Wiener, Norbert, Cybernetics: or control and communication in the animal and the machine, New York: Wiley, 1948, p. 137-55.

3. Ibid. p. 184.

4. Bush, Vannevar, "As we may think", Atlantic Monthly, v. 176, July 1945, p. 106-7.

5. Mooers, Calvin N., "The next twenty years in information retrieval: some goals and predictions" American Documentation, v. 11, July 1960, p. 229-36.

6. Platt, John Radar, "Where will the books go?" Horizon, v. 5, September 1962, p. 42-7.

7. Licklider, J.C.R., Libraries of the future, Cambridge, Mass. : M.I.T. Press, 1965, p. 127.

8. McLuhan, Marshall, Understanding media: the extensions of man, New York: McGraw-Hill, 1964, p. 349.