THE APPROACHING INFORMATION REVOLUTION AND ITS POSSIBLE IMPLICATIONS FOR RESOURCE SHARING IN CANADA

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ABSTRACT

Networks of large computer centers linked to the national telecommunications systems in future will offer instant access to virtually unlimited information. It is predicted that the information revolution will create a multibillion dollar industry in the 1980's. Interactive television systems could be utilized by libraries to participate in varous resource sharing programs. As the new systems will be competitive, costly to develop, and potentially profitable, it is conceivable that eventually large commercial (American) interests will capture and dominate the market in Canada.

UNE REVOLUTION DANS LE DOMAINE D'INFORMATION LES IMPLICATIONS D'UN SYSTEME DE PARTAGE DE RESSOURCES AU CANADA

RESUME

Des réseaux à partir de grands centres d'ordinateurs attachés à un système de télécommunication national du futur nous offrirons un accès immédiat à une multitude de services d'information. On prédit que la révolution dans le domaine d'information va créer une industrie qui aura une valeure de plusieurs millions de dollars d'ici les années '80. Un système de télévisions inter-dépendantes pourrait être utilisé afin de prendre avantage des programmes de partage de ressources. Etant donné que ces systèmes seront développés avec un esprit de concurrence et seront désormais très dispendieux, ils auront un potentiel de devenir très profitable. De toute façon il est concevable que de grandes compagnies américaines aient l'intention de s'accaparer du marché canadien et probablement avec succès.

INFORMATION REVOLUTION

INTRODUCTION

Pilot projects are underway in several industrialized countries with interactive television systems. One version involves the delivery of data and information to the home or business from central computers via the telephone lines, using the telephone, a modified domestic television set, and a push button style control unit as an information retrieval terminal. On August 15th, 1978, the Department of Communications announced the Canadian version of two-way television technology called Videotex. Bell Canada launched its Vista system on February 14th, 1979. Instant online access to virtually unlimited information by the general public through the national telecommunication systems appears to be feasible within the next decade. Interactive television offers new opportunities for information scientists as the new technology could have a revolutionary impact on the future course of social interactions.

Libraries and business establishments are among the prime users of online systems today. Online searching of the literature by librarians for their clientele demonstrates both the capabilities and limitations of the current practice. While the retrieval of information is very rapid and efficient, only a select group of people require the information, and access to the databases presupposes some experience and the knowledge of relatively complex procedures. The designers of interactive television systems aim to remove these constraints by considerably simplifying the access and retrieval procedures, by introducing new dimensions in databases, and by developing inexpensive terminal units. Optional hard-copy printers, voice and video memory could also be installed with the 'home terminal'.

The Canadian Videotex system would allow direct terminal-to-terminal communications, without the necessity of going through the central computer, thus enabling users to transmit graphic, textual, or tonal information to each other. Eventually electronic newspaper or mail service could be conducted faster, cheaper and using less energy than the traditional methods. In Britain subscribers to the Prestel system (originally Viewdata) can call up and view on their television screen textual information on various topics such as the weather, news and sports. At present the British Prestel and similar systems in Europe are still in the experimental market trial stage, with a limited number of subscribers, but potentially the market for two-way television is very large, virtually every household or business.

A POSSIBLE SCENARIO

Burchinal (1975) predicted a gradual path toward electronic communication networks. In his words, 'movement toward electronic communication networks ... will likely proceed through numerous, and often small, incremental steps. No doubt public, non-profit, and profit-seeking services will interact in ways we cannot now predict. Also movement will occur only as participants are convinced that they will derive sig-

nificant benefits from participating in emerging networks'.

Various groups, among them electronic component manufacturers and the information providers, who have physical or intellectual property for sale, will exploit the opportunities and promote communication networks, along with the designers and managers of the networks. The latter group will be obliged to accept the risks of marketing in terms of costs and revenues, and assume responsibilities for dealing with such various inherent legal problems as copyright and invasion of privacy. Ultimately whoever markets the information systems will have the option to decide what kind of information will be made available and to whom. In a free enterprise society where supply and demand controls information as a commodity, it is the users' prerogative to retrieve, or not to retrieve information, or turn to another competitive network for the same information. Individuals and business establishments would accept electronic information if the information had direct pecuniary or indirect personal value for the user.

The following list cites examples of valuable information presently obtained from different sources, but which could be retrieved online from a single databank by the general public.

directories
yellow pages
classified advertisements
job market
consumer information
information for farmers
  e.g. commodity prices
       practical advice
maintenance guides
  e.g. cars, appliances
legal information
medical information
road conditions
calculating services
  e.g. income tax guide
personalized information
home improvement
educational uses
reference information
bibliographic information
statistical data
use for the handicapped
  e.g. shut-in, deaf, blind
       with voice synthesiser

Recreational applications of interactive television could cater to persons interested in games, chess, do-it-yourself and other hobbies, genealogy, cooking, recipes, formulas, and films from video libraries.

Commercial and industrial establishments, which now transmit data and information primarily through the mail, telephone and telex, would find numerous applications for electronic online communications, probably as closed group subscribers.

Business applications of electronic communication include:

financial information
  e.g. balance sheets
       statistics
       credit rating
communication with branches
advertising
trade catalogs
market surveying
secretarial assistance
  e.g. typing at home
transmission of technical
charts, diagrams, drawings
banking
mail order

Even a few examples of expected applications suggest that the success of electronic information will depend on the ingenuity of the information providers in reaching wide segments of the population by demonstrating the value of information to them. To borrow a commercial phrase, electronic information amounts to a new way of 'packaging' and presenting information. Information is often free, yet when 'packaged', as for example abstract literature is in machine readable databases, the access is no longer free. Generally one has to make an effort to obtain free or nominally priced information, visit a library, turn to the mass media, or dial up an information service, but with interactive television, access will be as convenient as operating a push button remote control. An inexpensive, reliable and simple to operate two-way television service could compete with traditional forms of free information, and overcome users' resistance to the imposition of another kind of electronic media, or in popular parlance 'gadget'.

Information networks, whether privately or publicly funded, would be expected to recover the substantial investment in hardware and software required. While financial rewards may or may not be realized from the introduction of a new technology, at least not in the initial stages, in the long run universal application, increased national productivity, and eventual profits, would make the venture worthwhile. The high costs, risks, and rewards involved in developing a new technology will attract private enterprise, which means aggressive marketing, and the commercialization of electronic information services.

IMPLICATION FOR LIBRARIES AND RESOURCE SHARING

Public service oriented interactive television systems are being introduced at the same time that library networks are assuming an increasingly important role in the management of library resources. Some time in the future both applications of networking technology will be integrated into the total milieu of electronic telecommunications. At this early stage of development it would be prudent to monitor the evolution of public service oriented interactive television systems, and investigate the feasibility of using the hardware, storage and software facilities of future commercial communication networks as vehicles of library resource sharing.

Despite the rapid proliferation of library networks in recent years,

generally networks lack the ability to be connected with each other in an interactive manner, and as Williams and Flynn (1978) pointed out, it is not so much the technical barriers, but the economic, political, administrative and legal ones which hinder the interaction of networks. The planners of two-way television systems envisage a national network composed of a central and several regional computer centers, serving general, local and specialized information requirements. Any degree of participation by library networks in the national interactive television networks would open up library resources to every user, whether it be an institution, a small library, a business, or an individual.

Terminal-to-terminal communications could be expedited by groups of libraries willing to exchange information in a particular format mutually agreed upon and permitted by technical capabilities. As closed group institutional subscribers libraries could apply interactive television networks for interlibrary loan, union lists, co-operative acquisition and processing, bibliographic databanks, weeding and remote storage. Libraries are storage houses of a wealth of information, which is a desirable and useful commodity, and this very information content will be 're-packaged' by commercial communication networks and added to their databases in order to make their services more attractive. Reference type information, special tables for scientists, bibliographic data, widely used textbooks, and key journals, for example, would be in demand by a large number of users, who would appreciate immediate online access at reasonable costs.

A paradoxical situation may arise in the next decade; library networks will expand for the purpose of resource sharing and for direct interface with users through their own terminals, and simultaneously profit motivated communication networks will introduce commercialized information services and attempt to assume some of the functions now associated with libraries. Experience will determine the level of competition between public and private networks, or the degree of convergence of networks for more effective service, but meanwhile the duplication of efforts in the information field will continue.

IMPLICATIONS FOR CANADA

Curiously Britain and France have taken over the lead in interactive television technology ahead of the United States, a country traditionally receptive to innovation. But since the beginning of 1978 the United States began to display greater interest in interactive television systems, especially in Prestel (Dolan 1978). Potentially the United States could become the leading country with its large population base, advanced technological society, financial power, and enterprising attitude. A survey conducted in 1970 estimated that the size of the market for interactive television services in the United States would be in the neighborhood of 20 billion dollars per year, assuming 90 million households participated (Baran 1975).

It is not difficult to envisage a few American home information networks dominating the market in the same manner as American online systems hold a virtual monopoly over automated bibliographic literature searching on this continent. American interactive television systems aimed at the general public, business establishments and institutions may attempt to penetrate the Canadian market as well, since information has always moved relatively freely across the border. For example services directed towards American and Canadian libraries could include acquisition and processing assistance in addition to bibliographic literature searching as a large proportion of the information required and information sources purchased by Canadians originates in the United States. Such sources include books, documents, serials, television programs, audio-visual and other types of materials.

Foreign competition facing the Canadian information community has serious economic and social implications. The increased movement of information to Canada would lead to a growing balance of payments deficit and in the long run to further cultural dependency on the United States.

It would be possible to establish the mechanism for controlling the international flow of information. Black (1976) lists four major types of barriers which could be erected to inhibit the international flow of information.

a) custom duties and taxes on information
b) copyright restrictions
c) censorship and political control
d) technical barriers caused by varying national standards and conditions for the interconnection of computer communications devices

Obviously the more desirable option would be to search for more effective ways of counteracting the growing reliance on outside information sources and services. In a 'Position Paper' entitled: Communications and Computers the Science Council of Canada lists a number of policy problems affecting interactive television that have to be considered soon as there is little time left to influence the course of development (Science Council of Canada 1978). One of the concerns is the question of ownership, i.e. who would own the system: government, Canadian industry or foreign industry?

Information handling in Canada is split between the public and private sectors with the traditional emphasis on the services of the public sector (Alley, Lawford and Wolters 1978). Public control can ensure equal distribution of information, technological sovereignty, as well as self-reliance, in case information services are threatened for economic or political reasons. On the other hand, private enterprise, be it a home grown or a branch plant operation, brings competition and the entrepreneurial approach to information handling.

From the users' point of view the important features of an information service are the price, efficiency, and content. For Canadian users this means Canadian content. Unique Canadian content can be found in most aspects of local, legal, commercial and environmental information. Areas of co-operation between the public and private sectors in Canada should be explored, for example, exchange of databases and division of services. By identifying and promoting Canadian content, developing superior technology, and by reducing the duplication of efforts, Canadian interactive television would be in a more competitive position to counter American influence.

CONCLUSION

The potentials of interactive television are gradually emerging as each experimental project probes the capabilities and limitations of the invention vis-a-vis the users. This paper attempts to draw attention to a phase of interaction between future commercial interactive information networks and publicly supported library networks. Whether the mode of interaction will be complementary, co-operative, or competitive, the philosophy and practice of library services and resource management will be profoundly affected. Canada may have to face a particular problem; that of increased reliance on outside information sources and services.

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