TELETEXT: ITS DEVELOPMENT AND SOCIAL IMPLICATIONS

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ABSTRACT

The development of teletext systems in several countries is briefly reviewed, with an emphasis on the Canadian scene. Some benefits and problems associated with the widespread availability of interactive television are suggested, and ways in which the information science profession can help deal with the problems are indicated.

TELETEXT: LES RESULTATS DE SON DEVELOPPEMENT LES IMPLICATIONS SOCIALES

RESUME

Le développement des systèmes Teletext de plusieurs pays est étudié brièvement en ajoutant plus d'emphase au système canadien. Les avantages et les problèmes qui sont associés à la disponibilité universelle des systèmes de télévision inter-dépendante sont analysés, et les améliorations que peuvent apporter les spécialiste des sciences d'information sont suggérés.

"Until now the mind of man has manifested itself in a static fashion in isolated groups. What sort of current will be generated when the world's billions are suddenly wired together?" James Martin, The Wired Society.

Recent developments in communications, computers, and media technology have created a broad spectrum of possible new communication services for the home. Chief among these are teletext systems, which permit home television viewers to access, via a keypad or touch-tone telephone, and display on their television screen digital information from a computer database. Other new television-based services include home access to slide, video cassette, and film libraries, and beyond these are services based on such devices as home computers, citizen-band radios, and facsimile copiers.

An important common characteristic of all these new services is the capability they provide for user interaction, ranging from simple choice from a list of alternatives to free-form, user-generated messages, employing a full set of alphameric and special characters or graphics input. The user will be able not only to access the central store, but, eventually, to transmit messages to other users in an electronic mail drop.

This paper briefly reviews the development of teletext systems in several countries, with an emphasis on Canada. The authors' main interest lies in the human and social aspects, rather than in the technology. They discuss issues and problems that may arise with the wide-spread availability of interactive television and suggest ways in which the information science profession can help to deal with them.

REVIEW OF TELETEXT SYSTEMS

Many of the developed nations of the world are planning or implementing teletext-based systems. The earliest implemented in the United Kingdom, were CEEFAX and ORACLE. These are uni-directional, point-to-multi-point systems and have been available since 1974. Digitally encoded data (alphameric characters and limited graphics) are inserted on the blank lines between conventional television frames and thus a continuous stream of data is transmitted along with the regular program. The teletext stream may be tapped by a viewer with the necessary decoder. He finds the number of the page of interest from an index, enters the page number on his keypad, and when the page rolls around again it is captured and presented on the television screen.

The PRESTEL (formerly VIEWDATA) System, sponsored by the British Post Office and field-tested in the London area in the fall of 1978, offers the potential for a much more comprehensive and interactive information service. The user is presented with a menu of numbered general information categories. S/he makes a selection by pressing the appropriate

number on a keypad. The system responds by returning the desired information or another more specific sub-menu from which a further selection is made. PRESTEL already, in the field trial, offers a wide variety of information services extending from computation to information on jobs, leisure activities, travel, education and consumer products.

The Post Office has advanced the public launch date of PRESTEL to the first quarter of 1979 and will spend more than $100 million developing the system. Ten computer centers will be established, offering 250,000 pages of information. The current price of a PRESTEL TV set is 700 pounds sterling, but is expected to drop to 50 to 100 pounds over the original price of the TV set under conditions of mass production.

The PRESTEL system is being marketed in the U.S.A. by the INSAC Group, Inc.

The British Library has recently funded Langton Information Systems for two projects connected with PRESTEL. In the first, a study was carried out of the feasibility of using PRESTEL as a means of accessing British Library data bases. In the second, problems associated with mounting large-scale databases on PRESTEL, structuring the information so that it fits in with the PRESTEL hierarchical system, and presenting it so that it can be easily used and viewed, will be investigated.

In France, in late 1973, a joint research center of the French Post Office and the French Broadcasting Authorities began work on ANTIOPE. This system, now called TITAN, while similar to the British systems, offers greater flexibility. Unlike the British teletext system, data transmission is not limited to the vertical blanking period, but may occupy a complete channel. Furthermore, data are transmitted in packets, so that different services may share the same channel. On the negative side, ANTIOPE circuitry is more complex and costly than that used by the British system.

In the United States, development of an information system for the home has been slower than one might have anticipated, given the state of American technology and the speed with which the American consumer adapts to innovation. Reuters, whose home office is in England, began, in 1974, distributing a business-oriented service - the Reuters Information Data Retrieval Service - on the network of Manhattan Cable Television, a subsidiary of Time Incorporated, which covers Wall Street and the business district of New York. Then in 1976 a service designed for the general public was made available by Reuters to all lower Manhattan residents who subscribe to the Manhattan Cable Television. The service presents news, TV listings, theatre events, traffic reports, shopping tips, and real estate offerings to home television sets via a dedicated cable television channel. Users select desired items from an index using a keypad, as in the British systems.

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In Columbus, Ohio, the Qube System provides subscribers with the first large-scale use of "participatory television". Qube uses 30 television channels: an article in the Atlantic Monthly (Wicklein 1979) describes the channels as follows:

"Ten channels provide the commercial and public television stations, a public access channel, and a program guide channel. Another ten supply premium selections--primarily movies...that have not yet appeared on commercial television...Even greater participation is demanded by the system in the third group of ten channels--the community channels, where viewers are solicited to 'interact' with their sets."

Qube's participatory channels present such programs as political debates in which users can voice their opinions, garage sales and auctions in which users can purchase items, restaurant reservations, and surveys of consumer preferences. After one year of operation, Qube has attracted one-fifth of its potential market and, for the moment, is losing money. Warner Communications, the parent company, has put at least $20,000,000 into QUBE.

In Tama, Japan, the Coaxial Cable Information System station began broadcasting in 1976. This project is financed mainly by the Posts and Telecommunications Ministry of Japan. Nine different services are being tested, including original and retransmission telecasting, pay TV services, flash information services. One coaxial cable of 30 channels is used as the carrier for these experiments.

In Canada, a telephone-based study was carried out at the Carleton University Wired City Laboratory, under Department of Communications contract. (George 1977) Its purpose was to "improve the use and acceptance of community information systems by means of an interactive process whereby the viewer demand for specific items of information could be more effectively satisfied." George's Phone-Info System transmits each information page to the viewer in video rather than digital form via cable television. The viewer requests a specific page of information using a touch-tone telephone. S/he then receives the pages requested by other users ahead in the queue, before receiving his/her own. Hence, there is room for considerable improvement in the response time and interactive capabilities of the system.

In Montreal, Telecable-Videotron has, since 1977, provided an interactive service to city residents. This is based on a video library of approximately 5000, 3/4" video cassettes on a wide variety of subjects. Users request a program by telephone on a first-call first-served basis. Automatic cassette handling equipment allows for queues of up to 3 cassettes. The plant cost $500,000 and operating expenses run at $160,000/year. Market penetration is 51%. 31,000 subscribers pay $9.25/month for the service.

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In the spring of 1978, a proposal (Dolan 1978) was submitted to the Canadian Department of Communications for the development and field trial of new communication services to the home, to be known as the HODIS study (Home Data Information Services). Because of the high penetration of cable television in Canadian homes (50%) it is likely that teletext systems in this country will be CATV-based, like the French TITAN rather than the British PRESTEL system. HODIS had as its aim the integration of information, communications media, and computers to provide a configuration in the home designed to respond to social needs for information, education, and entertainment, at a price the average Canadian family could afford to pay.

Specifically, the HODIS project would involve an investigation of the following:

1. The practical information and entertainment needs of Canadian families which could be satisfied by new home communication services.

2. How much will they cost? Who will pay?

3. Potential suppliers of the services.

4. The optimal form and content of each service.

5. The optimal access mechanism for HODIS.

6. The optimal media/communications/computer configuration for HODIS.

7. The optimal home terminal design.

8. Regulatory and legal problems which may arise in the implementation of HODIS.

To achieve these purposes, the study would involve the definition, planning, implementation and analysis of a field trial of a prototype HODIS system in a sample of homes from a representative Canadian community.

In August, 1978, the Canadian Department of Communications announced the development of a two-way TV system called Videotex (later Telidon). It is superior to rival British and French systems in that it allows users to retrieve computer-stored information via telephone or cable TV. It offers higher resolution of TV images, providing superior graphics. Unlike the British system, which has a character-oriented approach to display, the Canadian system builds up pictures from a set of graphic primitives such as point, line, area, and color. In addition, the Canadian system is the only one so far available that permits users to

communicate directly with one another. The obvious implications include electronic mail and teleconferencing.

The Department of Communications has awarded a $245,000 contract to Norpak, Ltd, an electronic firm in Pakenham, Ontario, for the further development and construction of interactive visual communication systems. Current price of Telidon terminals is $15,000. It is expected this will plunge to a few hundred dollars following the introduction of VLSI technology.

Several field tests of Telidon have been announced. Grand River Cable TV, a subsidiary of Canadian Cablesystems in Kitchener, has applied to the CRTC for permission to institute a $200,000 market trial. A U.S. version of Ceefax will be implemented as soon as permission is obtained and Telidon equipment will be added late next year.

Rogers Cable TV of Toronto has announced plans to implement Reuters Information Data Retrieval Service, mentioned earlier, in downtown Toronto.

Bell Canada, Torstar Ltd, and Southam Press will also field test a teletext system. Bell will provide the hardware and distribution network, while Southam and Torstar will provide the information. Bell originally planned to use the Prestel system, but is now exploring technological compatibility with the Telidon terminals for upcoming field trials in Toronto, Ottawa, and other locations. Bell management claim that their system could be adapted to an existing TV set for $200-300 assuming mass production.

One hundred and fifty Telidon terminals will be used in a joint DOC-Manitoba Telephone Systems "wired city" project in Ely, Manitoba. Ely will become a test bed for advanced communication technologies, including fibre optics. The town's 350 inhabitants will be fully wired by 1983.

The Ontario Educational Communications Authority (OECA) also has a joint pilot project with the Department of Communications. This one will demonstrate the advantages of Telidon in both broadcast and interactive model.

As this survey of teletext activities shows, there is no truly integrated approach, spanning all possible media and supplies, either in this country or abroad. Present field tests are being implemented by individual media or service representatives, predominantly telephone and cable companies. Broadcast media have been relatively uninvolved. Ideally, media alternatives should be evaluated by an independent agency and negotiations with transmission media made impartially and free from conflicts of interest.

It is very important that the evolution of teletext systems take place in an R & D environment, along the lines of Campbell's "Reforms as Experiments" model (Campbell 1972). Otherwise, this endeavour is likely to be constrained by regulatory bodies prematurely imposing legislation to prevent the "establishment of precedents". The actual effect of such action would be to prevent "hypothesis testing", thus stifling the very experimentation required for enlightened regulation. Campbell labels this phenomenon the "trapped administrator syndrome".

SOCIAL ASPECTS OF TELETEXT SYSTEMS

Many questions are being raised about the social aspects of teletext systems. These range from technically-oriented questions concerning the user interface to horror stories about "big brother" monitoring all aspects of an individual's life. These aspects of teletext will now be considered, under two headings: (1) the user interface in teletext systems, and (2) benefits and dangers.

The User Interface

The user interface problem really resolves into three questions:

1. What is the most effective method of accessing the totality of the information that will be available on new home communication services? To be truly useful, the index to the information must be comprehensive, efficiently structured, and easy to update. On the other hand, it must be capable of use by a wide variety of users, with different educational levels, social backgrounds, and even languages. It must provide access to information available on all different media--cable television, broadcast television, telephone, radio, citizens' band radio, facsimile transmission. Both the language of the index and the access method--hierarchical, Boolean, weighted, or some other--must be optimized. Consideration must be given to incorporating computer-aided instruction techniques in the index-access procedure. In more complex systems, such as Telidon, which permit a greater degree of interaction than mere selection, a full-scale command language must be developed which will be both powerful and simple to use.

2. What is the most effective method of presenting the information on a video screen? Conventional typographic and display techniques cannot be applied to the unique problems of teletext systems. A recent paper (Foley 1979) outlines the shortcomings of present research and points out direction for future development.

3. What is the optimal role of the human intermediary in the transmission of information to the user? When is personal interaction important? When can it be eliminated? It seems obvious that where a problem has an emotional component, where the user is new to a community or of a different cultural or language background, something more than impersonal querying of a computer database is required. Even factual information, like weather or road conditions or travel schedules, is accepted as more reliable when it is delivered by an interacting person, rather than a "recorded announcement". The ways in which a human intermediary can be incorporated into the distribution of information by new home communication services must be explored.

Benefits and Dangers

Teletext systems have important implications for the distribution of community information. Community information may be defined as that information a resident requires in order to solve the practical problems of life in his/her community and make optimal use of its facilities and amenities. It embraces textual, numeric and graphic information. Queries about social services, educational facilities, retail outlets, consumer products, employment, clubs and organizations, recreational facilities, and forthcoming events are all directed at this category of information. They are answered from various sources, depending on the political, economic, and geographic nature of the community. The usual sources are the media -- radio, television, newspapers, magazines, community information centers, also known as information and referral centers and citizens' advice bureaux, libraries, specialized government services (for example, manpower or taxation centers), and private or commercial agencies (for example, travel agents, real estate offices, academies of medicine). Another aspect of community information is census-type data--socio-demographic statistics, which are an essential base for social planning.

The one agency, in Canada, which deals specifically with community information is the community information center. Its functions, however, are not necessarily limited to informing. They include, as well, referral, follow-up, and advocacy. The revised U.S. National Standards for Information and Referral Centers define these as follows:

> Referral: assessing the needs of the inquirer and directing the inquirer to appropriate organizations capable of meeting those needs.

Follow-up: determining the outcome of a referral and/or information-giving; additional assistance in locating or using these or other services.

Advocacy: actions taken within organizational limits to obtain needed services for an individual or a group of individuals when needed services are being provided by an organization of the community's established service delivery system.

What changes can be expected in the distribution of community information as a result of the new home communication services described above? Some see them, because of their interactive capabilities, as a panacea for all current problems of communication breakdown and alienation which afflict residents of present-day communities. It is possible, for example, to store in a computer database all of the factual information used by community information center personnel--names, addresses, phone numbers, contact people for organizations and agencies, descriptions of their services and facilities. Such a database, called CACTIS, has been developed (TAGUE 1976, 1977) for the community information center in London, Ontario.

Some of the services suggested for home delivery in the HODIS project correspond closely to information to be found in most community information center databases. These include guides to events and entertainment, travel schedules, consumer services, government information, social service information, educational information, medical and legal information, and many others. If new home communication services provide a database of this range, what need will there be for community information centers or similar agencies?

The answer, as any community information counsellor or reference librarian knows, is that acquiring and maintaining the information base is only a part of the role they play in satisfying a user's needs. The other, and more difficult part is matching the information to the individual's need. The user may not understand how to use the directory or catalog, s/he may not interpret the information in the database correctly, and, finally, s/he may need information which is not in the database. Unfortunately, these aspects are receiving little attention from the designers of teletext and similar systems, their concerns being primarily with technical and marketing problems.

Other implications of teletext systems on the distribution of community information should be mentioned. The first involves standards of accuracy of the information provided. As is well known to advertisers, a message displayed on a television screen has a much greater impact than

the same message in a magazine or newspaper. Because of this increased exposure, community information on teletext systems must be subjected to more rigorous verification and control than has hitherto been required. It was found in the CACTIS project that once the community information center began to distribute to other agencies directories of information from its computer database, much more time was needed for checking and organizing the information properly than when it had been used only internally. Errors, faulty or out-of-date statements, and omissions that the community information center worker could correct in interpreting the information for a client now had to be in proper form in the database itself.

As information that is based on polls and surveys or consumer product testing becomes more generally available on the television, the individuals and companies that are in some sense being evaluated will apply increased pressure on the information supplier to produce the evidence for the data. There is a need to develop general measures of the precision and reliability of information, similar to the standard error and confidence level of statistics but capable of being applied when the information is not based on a random sample and capable of being understood by the layman, as well as the specialist.

Then there is the vision or nightmare evoked by the Martin quotation at the beginning of this article. Do we really want a world in which there is no isolation, no privacy? Interactive television opens a Pandora's box of privacy invasion and computer crime. Once viewers interact with a computer system their interactions can be recorded and analyzed. For the most part, viewers will be unaware that this is happening. As the recent University of Alberta computer theft case indicates, (Keenan 1979) computer security can be breached by anyone bright and inventive enough to do it. Clearly, some federal legislation is needed concerning privacy in two-way systems. Otherwise the privacy of all potential users is 'for sale'.

Or will isolation really be reduced? Is it not possible that increasing availability of home communications services will base people more firmly in the home, make them more isolated? Martin speaks of the possibility of a widespread increase in home-based remunerative activity, of cottage industries. Much energy and human time is now wasted commuting to and from work. Many white collar workers could now carry out their functions equally well at home if home-office communication facilities were improved. However, whether it is possible to combine modern-day "work" and child rearing at home, as was done in earlier times, is an interesting social question.

Other potential abuses of teletext lie in the area of advertising and direct sales. Interactive cable provides an easy access to many products. An item may be purchased simply by pushing a button. Impulse buying may reach new heights, facilitated by electronic funds transfer

that can be effected from the home TV set.

Finally, there is the omnipresent question: who pays? With PRESTEL, there will be a charge for accessing some pages, depending on the information provider, others will be "public service" items. From the point of view of economists, "public goods" are those goods, or services, which are consumed in equal amounts by all consumers in society; "private goods" are parcelled in different amounts to consumers. What kinds of community information satisfy this criterion? Should they then be paid for from public coffers--i.e., taxes. What kinds of information benefit only a minority? How should the charge for specialized services be determined? Should charges be inversely proportional to the size of the user group? Should special request information be completely charged to the requesting user? What happens if another user then appears? Does s/he get it for less? These questions cannot be answered properly without consulting those most experienced in providing and charging for information--the information specialists--us!

It is essential that the information/documentation profession which this group represents, become more involved in the development of these new home communication services. On the one hand, the system designers need our expertise in developing information transfer systems which are optimal from the point of view of satisfying the user's information need. On the other hand, in order to remain a viable part of the information sector, we must become involved in the new communication services. The alternative is obsolescence.

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