Viewdata and SCITEL Bring Interactive Information Systems Into the Home

Many Americans with cable television already enjoy the ability to receive various kinds of information on their home TV screens. But continuously displayed news headlines, weather, and stock market information is primitive in comparison to the on-line information access that many professional people have become accustomed to. That is why the imminent availability of interactive communication between citizens in their homes and computerized data banks is news of far-reaching social significance.

Since the technology already exists to convert your home television set into a computer terminal operated over regular telephone lines, ISI® has been investigating potential applications. Recently we have become involved in the development of a system called Viewdata. So far the system, operating in Britain, is in the prototype stage. But if tests planned for next year prove successful, a new era will have begun. In less than a decade more than a million private homes in Britain may have access to an array of information banks that would boggle the imagination even of H.G. Wells, creator of the World Brain.[1] Undoubtedly, once the political and other impediments are overcome,we can expect that a similar system will become available in the United States, where even more advanced technology exists.

Viewdata, developed by the British Post Office, allows subscribers to use their telephone lines to select "pages" of text for display on their home TV screens. The information now available to a small test market through Viewdata includes general news, sports, radio and TV program schedules, entertainment (film and performance schedules), holiday and travel information, stock market reports, general marketplace information, and science news. Each Viewdata "page" consists of about 1,000 characters (200 words).

What makes the system especially attractive is that the user needs

no special training. To use it, you dial a number on your phone. This provides access to a local minicomputer, which can handle many inquiries simultaneously. You proceed by operating a small 10-button numeric keypad, provided by the telephone company. Once you have keyed in, the computer displays up to ten lines of information, which in effect constitutes an index to all the available information. To select one of the displayed choices, you merely press the appropriate digit. This causes a new series of choices to be displayed. By this interactive procedure you zero in on the particular page that contains the information you want.

The system is operated by the British Post Office, but data bases are provided by various other organizations. For example, ISI provides the SCITEL™ service. This is a current science news program which I will discuss later.
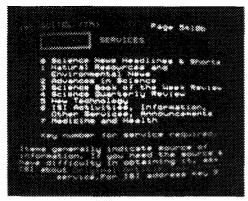
The Viewdata system may prove to be the most important development in decimal classification since Dewey. By a rapid keying of the right number one has access to thousands—and potentially millions—of pages. The selection path is analogous to the branch structure of a tree. Each selection made by the user results in the presentation of 10 more choices. Six successive digits select one out of one million pages. T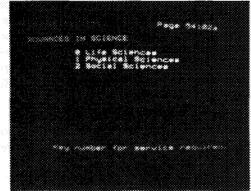hus a nine-digit number could select one page out of one billion! This is enough to store a vast library of information, including the *Science Citation Index®* , various encyclopedias, and a vast collection of books, journals, magazines, and newspapers.

In the British prototype of Viewdata, information is sent back along the telephone line almost immediately after a command is sent to the computer. Words are written out on the screen as fast as they can be read, and a complete page is received in a few seconds. If a viewer goes through the entire successive selection process, it may take a little while before the desired page is displayed. However, once the viewer knows the specific page number of the desired feature, the response can be almost immediate.

The minicomputers themselves perform the relatively simple task of responding to keyed commands by retrieving pages from disc memory. They also monitor the amount of time used by subscribers on specific data bases, so that the revenues received can be distributed among the network's suppliers.

Viewdata is presently in the pilot stage, with specially designed receivers available only to the British Post Office, information suppliers and manufacturers. The general public now can see Viewdata only at displays and exhibitions. However, in June 1978 the first serious marketing trial of Viewdata will begin. For this trial the Post Office ex-
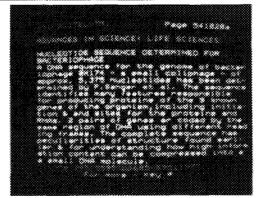
Figure 1. Viewdata sample pages as photographed from the television screen (loss of clarity due to reduction). By keying "2" and "0", the viewer goes from the SCITEL™ page at the top to the one at the bottom.

pects to sell about a thousand Viewdata systems in the London, Norwich and Birmingham areas.

The pilot trial will use one minicomputer with up to 70,000 pages of storage. If the trial goes well, Viewdata will become a public service in Britain. At that point a network of minicomputers will be needed. One machine can serve about 10,000 subscribers.

When Viewdata becomes a public service, subscribers will be provided with off-line backup. This means that they will be able to request, via a reference number punched on the keypad, specific documents related to viewed items. The requests will be forwarded from the network to the supplier, who will mail the document to the viewer. A viewer may also be able to send a message to another viewer, to be stored in the recipient's receiver until he or she comes to view it.

ISI's European branch now supplies the Viewdata system with a science news segment called SCITEL. SCITEL's coverage emphasizes multidisciplinary news items in the medical and health sciences, chemical and physical sciences, technology, and the life and social sciences. In addition, SCITEL covers science policy, corporate news, recent advances in science, and news about scientists themselves. It also provides weekly book reviews.

Let us assume that a user has ac-cessed ISI's SCITEL data base. An introductory frame explains what ISI is. The next frame presents the main routing (or index) page—a table of contents for SCITEL. The choices listed include science news, natural resources and environmental news, advances in science, a science book of the week, a science quarterly review, new technology, ISI activities, medicine, health and energy. If you choose "science news," a new routing page displays the following choices: headlines (items of major significance), shorts, people, company news, and science policy. Keying "advances in science" would offer choices in life sciences, physical sciences, and the social sciences. A few sample SCITEL "pages" photographed from the TV screen are reproduced in Figure 1.

SCITEL's coverage resembles that found in science magazines such as *New Scientist* or *Science News*. However, unlike printed magazines, the electronic medium of Viewdata allows information to reach the consumer with almost no time lag. For instance, some months ago when US scientists succeeded in isolating the cause of the "Legionnaires' Disease," we announced this news over SCITEL as soon as the story came in over the wire services. Newspapers did not carry the story until the next day. For an information scientist involved with current awareness on a day-to-day basis,

the beauty of Viewdata is that it can be as current as the speed of light, the speed at which electronic signals travel through phone lines to the television receiver. But it remains to be seen whether consumers want or need access to such information so quickly.

Besides ISI, the other information suppliers for Viewdata include British Rail, the Tourist Board, the Consumers Association, Exchange Telegraph, the British Farm Produce Council, and several book and magazine publishers. Information providers are equipped with a special keyboard and modem (modulator-demodulator), enabling them to set up their material on their own display screens and, after review, to transmit it to the minicomputer data base.

There already has been speculation that the production and marketing of Viewdata equipment might cause the greatest electronics boom since color television.[2] When color television sets are modified to contain the Viewdata decoder and are manufactured in quantity, the extra cost is expected to be about $85.[3] In Britain, where most television sets are rented, this means a monthly rental increase of about $1.70. The keypad and telephone line facilities required for Viewdata can be integrated with the receiver, and also would add slightly to the cost.

The additional costs borne by the Viewdata subscriber include the price of the phone call to the network, a charge for connection time to the minicomputer, and the database charge. A 5-minute session will probably cost the user about 35 cents. One such session daily would cost the user about $120 per year.[3]

The 200-word limit per "page" might make it awkward to store the traditional page of scientific information. But if properly organized, the Viewdata system may have a significant impact on home education. How many disputes could be settled by quick perusal of the Viewdata file on sports statistics or an up-to-date almanac of facts and figures, not to mention multilingual dictionaries, encyclopedias, and reference works of all kinds?

Other systems similar, but not identical, to Viewdata have been developed for a variety of purposes. Generically, these are called "Teletext" systems. In Britain two Teletext news services known as Ceefax and Oracle have been introduced by the British Broadcasting Corporation and the Independent Broadcasting Authority, respectively.[4] These services can be viewed only on TV sets equipped with decoders. In the future, receivers will probably be equipped with combined Viewdata/Teletext decoders. Like Viewdata, Teletext information can be updated constantly. The great difference between Teletext and Viewdata is that Teletext information is broadcast continuously. It oc-

cupies a small part of the channel devoted to transmitting entertainment TV. Since there is no telephone line connection, viewer interaction with Teletext systems is limited to "capturing" a desired page by setting a control on the receiver. Also, the number of pages on Teletext systems is limited to a few hundred, while Viewdata can be made as large as required, provided sufficient memory capacity is given to the computer.

In the US several Teletext-type computer networks are already operating. In New York the British-owned Reuter news agency has financial news-on-demand available to cable-TV customers. Within the year, a Reuter general news service is expected to begin.[5]

Whether Viewdata can replace the newspaper remains to be seen. TV has already changed the role of newspapers, but they continue to thrive. In fact, the brevity of Viewdata presentations may whet the appetite for fuller coverage in newspapers, magazines and journals, as well as many types of reference books.

Viewdata can help create a new relationship between people and their television sets. The viewer, instead of passively absorbing whatever images cross the screen, can actively interact with what is being displayed, controlling the information presented on the television screen in a way never before possible. You might say that until now we have lived in the thumb-indexed era. To use a printed directory you have had to use your thumb to access randomly chosen information. Now the Viewdata keypad requires the use of your index finger. From our experience with on-line systems like SCISEARCH® we know that people prefer the simplicity and speed of the keyboard over the clumsiness of turning pages. Keying information also saves the time required to write it out. Future TV sets may even permit viewers to make a hard copy of displayed information.

There are some exciting times ahead.

1. **Garfield E.** The world brain as seen by an information entrepreneur. Presented at the American Association for the Advancement of Science Symposium on "Reorganizing information resources to improve decision-making." San Francisco, February 1975. Reprinted in: *Information for action: from knowledge to wisdom* (Kochen M., ed.). New York: Academic Press, 1975, p. 155-60.
2. **Teletext** to be small fry along-side Viewdata. *New Scientist* 73:586, 1977.
3. **Cawkell A E.** Developments in interactive on-line television systems and Teletext information services in the home. *On-Line Review* 1:31, 1977.
4. **Valery N.** Foot in the door for the home computer. *New Scientist* 74:63, 1977.
5. **Hoagland S.** Britons dial TV 'newspaper.' *Christian Science Monitor* 69(149):15, 1977.