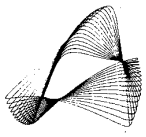
Viewdata '80, London, 1980.

VIEWDATA AND VIDEOTEXT, 1980-81: A Worldwide Report

Transcript of viewdata '80, first world conference on viewdata, videotex, and teletext



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Viewdata and Videotext, 1980-81: A Worldwide Report

Transcript of viewdata '80, first world conference on viewdata, videotex and teletext, London, March 26-28, 1980

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Introduction & Preface

The use of the ubiquitous TV set as an information display and interactive personal electronic communication device will bring dramatic changes to the way in which we conduct our day-to-day lives. The effect will at first be most apparaent in business with the easy availability of computer-stored information and the ability to send and receive mail electronically. The effect will then become apparent in the home with the TV set gradually enhancing its primary role of entertainment device to incorporate information acquisition, computer-aided education and electronic message transmission.

This book comprises written back-up to the presentations given at Viewdata '80 - The First World Conference on Viewdata, Videotex and Teletext.

To ensure that the preprints are as up-to-date as possible, the authors have supplied them to us in camera-ready form which does not allow for editing and for this reason we would ask for your understanding with some of the overseas papers where English is not the author's native language. In order to keep the book as up-to-date as possible, the papers have been printed in random order.

Contents

Educational applications for viewdata

Authors

Biographies

Authors of the papers contained in this book have been invited to send biographies of themselves to be included in this section. Those which we have received are listed below.

M H Aston has been associated with Prestel since its inception, particularly in the educational field. He is educational Prestel consultant to the Council for Educational Technology for the United Kingdom and Deputy Director of the Advisory Unit for Computer Based Education at Hatfield, Hertfordshire.

O Bärlund graduated from the University of Helsinki in 1973 when he gained his M.Sc. degree in computer science. After working in the Computer Science Dept. in the University he joined Softplan in 1974. Since 1975 he has been assigned to videotex research and development within Softplan and has been responsible for the software development in the Telset and Mistel projects.

Sir John Barran is head of the Central Office of Information's Viewdata Unit which he helped to set up three years ago. He is also Chairman of the UK Government's Inter-departmental Working Party on Viewdata and, as such, is involved in co-ordinating the activities of all Government Departments in this new medium. In addition, he is a member of the Council of the Association of Viewdata Information Providers (AVIP); and Chairman of their International Committee. He also sits on the British Post Office's committees for Information Providers and Market Research.

Sam Berkman is a Project Manager in AT&T's Residence Marketing Department and has just completed a Videotex Concept Trial. He is responsible for the guidance of the development of new residence products through introduction and for the management of the Videotex Concept Trial. He has been with AT&T Marketing for three years, and had been with Western Electric Company the previous three years. Prior to his marketing positions, Sam held numerous Western Electric assignments in Engineering and Manufacturing Operations.

Gregor Bochmann received the Diploma in physics from the University of Munich in 1968 and a Ph.D. from McGill University, Montreal in 1971. He has worked in the areas of programming languages and compiler design, communication protocols and software engineering. He is currently Associate Professor in the Département d'Informatique et de Recherche Opérationnelle, University of Montreal. His present work is aimed at design methods for communication protocols and distributed systems. At present, a project on databases for Videotex applications is underway at Montreal University.

Peter Bowers joined the TVOntario organisation at the end of 1967, when it was still in its formative stages. Initially as Chief Engineer and latterly as General Manager of Operations, he participated in the development of the organisation to its present state, where it broadcastseducational programs 5500 hours per year on the 9-station television network in Ontario. Most recently TVOntario has launched two significant field trials under his direction. He graduated from the University of Toronto in 1956 in Engineering Physics and in 1972 acquired an MBA from YorkUniversity.

Herbert Bown studied at Memorial University in St. John's and Nova Scotia Technical College in Halifax, where he received his Bachelor and Masters Degrees in Electrical Engineers. He joined the Defence Research Telecommunications Establishment and remained with them when it became the Department of Communications in 1969. He is Director of Data Systems R&D and Telidon Program of the Department of Communications. As Manager of the Image Communications Program, he was responsible for the Research and Development activities which resulted in the Telidon concept. He is a member of ACM, IEEE, CIPS and APEO.

Roy Bright is well known in the UK and overseas for his long association with the British Post Office. During his BPO career he worked extensively in the field of data communications including Packet Switching (EPSS). In the early 1970's he began his major involvement with Viewdata and laid the foundations for today's commercial and policy strategy for Prestel; first as Project Sponsor then as Commercial Manager for the world's first viewdata trials. During the late 70's he was responsible for the successful series of collaborations between the BPO and Adminst rations in West Germany, Holland and elsewhere. In late 1979 he joined the French Adminstration to establish a new subsidiary whose aims are to promote international participation in the French Telematique programme.

Stephen Castell obtained his B.Sc. in Maths, Physics and Psychology from London University and his M.Sc. and Ph.D. in Maths from Nottingham University. He began his career in industry as Applied Mathematician at British Aluminium Company Ltd. His last appointment before starting to run his own business was a Group Management Services Manager for merchant bankers Bremar Holdings Ltd. In November 1978 he founded Castell Computer & Systems Telecommunications Ltd and co-founded Infolex Services Ltd.

Avinash Chitnis received the B.Sc.(Eng.) Honours degree and the ACGI diploma from Imperial College, London. He subsequently became head of the facsimile group at the British Post Office Research Department and was the section head at Xerox Research (UK) Ltd. He joined Bell-Northern Research Ltd Ottawa, Canada, in 1976, where he is now the manager of the Videotex System Planning group. He also represents BNR at CCITT meetings of videotex. He is a chartered engineer and a member of the IEE, as well as a member of the Association of Professional Engineers of Ontario, Canada.

Dr Walter Ciciora is Manager of Video Processing, Advanced Development at Zenith Radio Corporation in Glenview, Illinois. He holds a Ph.D. in Electrical Engineering from Illinois Institute of Technology, awarded in June 1969. His M.S. and B.S. are also from ITT. He has an MBA gtom the University of Chicago awarded in 1979. He is a senior member of the IEEE and also a member of the SMPTE, AES, Tau Beta Pi, and Beta Gamma Sigma. He has been awarded four patents and has several pending.

Maria Cioni received an honours and master's degree from the University of Calgary in 1969 and 70. She earned her doctorate in 1974. As Policy Advisor to the Executive Director of the Canadian Radio Television-Telecommunications Commission from 1975-78, she conducted studies into such matters as Federal/ Provincial responsibilities under the Broadcast Act, advocacy advertising, advertising aimed at children and the impact of cable and satellite transmission on Canadian broadcasting. In 1978 she authored a study on the history of multi-lingual broadcasting in Canada. She joined the Department of Communications in 1978 and is currently Manager of Liaison for the Telidon Project at the Ontario Educational Communications Authority.

Keith Clarke studied Electrical Engineering at the University of Bradford and Computing Science at Imperial College. In 1964 he joined the Technical Support Unit of the Treasury. In 1970 he joined the computing division of the Post Office Research Centre and was responsible for computer graphics and computer aided design. He assisted Sam Fedida in drafting his original Viewdata specification and as the project grew, gradually devoted more of his time to this project. By 1975 his section was concerned entirely with Viewdata research and in 1978 he became Head of the Viewdata Division.

Roger Cooke graduated in Electrical Engineering and has a Ph.D. for work on microwave antennas. He continued work in this area on joining STL but more recently has taken charge of STL's Data Terminal Technology Department and is responsible for various business terminal developments.

Jose Costa received the Industrial Engineering (Electronics) degree from the Universidad Politecnica de Barcelona, Spain, in 1971, and the M.A.Sc. degree in electrical engineering from the University of Toronto, Canada, in 1973. During 1977-1978 he held a fellowship in the Canadian Department of Communications, Ottawa, doing research on future communication services. He joined Bell-Northern Research Ltd, Ottawa, Canada, in 1978, where he has been working on new services planning. He is a member of the Insitute of Electrical and Electronics Engineering (IEEE).

Jim Courtney has spent 20 years in the Travel and Leisure Industry covering the whole spectrum of the business from retailing, overseas tour operating to domestic tourism, holding sales and marketing managerial responsibilities with Lep Travel, 4-S Travel, Hightime Holidays, Strand Hotels and Ellerman Sunflight. He was one of the founder members of Holiday U.K., the tourist board-backed domestic tour operators and travel agents marketing consortium. In 1979 he formed his own marketing and P.R. consultancy specialising in the Travel and Leisure Industry - Videotel - Courtney Sears Marketing Ltd.

Michael Davis works with Baric Computing Services Ltd in their Viewdata Department as a Consultant. He was educated at Clifton College and Harvard Business School. He was a National Service Communications Officer in the West Indies and Central America and worked in the paper and car industry before becoming Managing Director of one of the largest Packaging Companies in the U.K. He has been in the Data Processing industry for the last 5 years and joined Baric's Viewdata team soon after Baric became an Umbrella IP on Prestel and is specialising in the Travel Industry.

M Y Gates graduated in Physics and Mathematics from London University and is currently working in the field of new technology applied to printing and publising, with special responsibility for Viewdata. Her previous work has included the development of a computer based information service for the paper, printing and packaging industries and the introduction of an on-line database.

Jean Guillermin is an engineer who graduated from the Ecole Polytechnique and Ecole Nationale Supérieure des Télécommunications. He has a Master's degree from Harvard University. He was a research engineer in radio and television acoustics at the ORTF (formerly the Office of French Radio & Television), where he launched the automation program for the entire transmitting network. As Regional Director of Télédiffusion de France from 1975-78 in Lyons, he was in charge of operational and implementation management within the Center-East part of France. He was appointed President and General Manager of SOFRATEV (Société Française d'Etudes et Réalisations d'Equipements de Radiodiffusion et de Télévision) in October 1978. He is chairman of the board of SOFRATEV and of Antiope Videotex Systems Inc. (SOFRATEV's U.S. subsidiary) in Washington D.C. He is a member of the Managing Committee of CCETT in Rennes.

Hartford Gunn is the senior Vice President and Manager of KCET, the member station of the Public Broadcasting Service in Los Angeles. He has served in American public broadcasting for the past twenty-eight years. From 1970 to 1976 he was the first President of the Public Broadcasting Service. He holds an MBA degree from Harvard (1951) as well as an A.B. from Harvard (1948) and a B.S. from the Merchant Marine Academy at King's Point (1948). He joined KCET in 1980 to concentrate on its local station efforts. He will explore how KCET might expand its services through the use of other telecommunications media.

Gregory Harper has been a producer of television documentaries for WGHB in Boston and of syndicated television game shows in the U.S. He has been conducting research on teletext for the past two years, specializing in its educational uses and in the problems of teletext interfaces with computers. He is an active participant in the Electronic Industries Association's Committee on Teletext, acting as liaison with the international standards organizations. He is now a consultant on teletext.

Gerald Haslam is Director of Videotex Service of Southam Inc., a large Canadian publishing and communications company. He is President of VISPAC (Videotex Information Service Provider's Association of Canada) and Treasurer of IVIPA (International Videotex Information Provider's Association). A former broadcaster and newspaper editor, he is a member of the board of directors of Infomart, the national videotex service and electronic publishing enterprise of Southam Inc. and Torstar Corporation.

John Hedger joined London Weekend Television in 1974. He has been part of the ORACLE team since the commencement of the project and has since been closely involved with the development of all aspect of broadcast teletext. He now holds the post of System Co-ordinator and has special responsibility for the development of subtitling, telesoftware and related new technology.

Fred Heys graduated in Electrical Engineering and spent several years in data processing and operational research. He then joined STC's Marketing Directorate to work on a variety of new business projects, one of which is viewdata.

Ryoichi Inoue graduated from Tokyo Institute of Technology in 1959. From 1974 to 1975 he was engaged in developmental research on the Video Response System VRS at Engineering Bureau of NTT. From 1976-78 he was engaged in developmental research on telecommunication systems at the Tokyo Telecommunications Bureau of NTT. He is now engaged in planning and promoting the CAPTAIN system experimental project at the CAPTAIN Research and Development Center.

Takao Kumamoto graduated from Keio University, Tokyo, in 1964. From 1971-1973 he was concerned with the planning of computer industry policy at the Ministry of International Trade and Industry. Up to 1978 he was engaged in developmental research on a data communication system at the Data Communication Bureau and Yokosuka Electrical Communication Laboratory of NTT. He is responsible for the planning and development of CAPTAIN system at the Engineering Bureau of NTT.

Nobo Kurushima graduated from the School of Science and Engineering, Waseda University in 1951. He joined the Yomiuri Shimbun in 1950 and has been working as Chief Electronics Engineer, Office of the President of the Yomiuri Shimbun since 1975.

Jon Maslin has worked as a production controller in the printing industry and subsequently in the information department at Pira providing information services to the printing industry. These have included computer-based information collection and dissemination activities, newsletters and product reviews. Latterly he has been responsible for developing and evaluating information and training services on viewdata for industry.

Jean-Paul Maury graduated from Ecole Polytechnique in 1962 and Ecole Nationale Supérieure des Télécommunications in 1967. He joined the Centre National d'Etudes des Télécommunications in 1968 where he worked in the field of network planning and management. From 1973 to 1978 he has been in charge of the intertoll network and numbering plan at the General Directorate of Telecommunications. He is now Director of the Electronic Directory Project for the French P.T.T.

Pat Montague was Assistant Production Manager at the Manchester Evening News for six years from 1965. In 1971 he joined Lancashire Colour Printers as Assistant to the Managing Director. A year later he was appointed Director and General Manager of the Birmingham Post and Mail Ltd, a post he held for four years. He became Technical Development Director in 1976, a post he still holds.

Ken Morioka is currently responsible for strategic planning for Voice and Data Communication Networks for Control Data. He began his career in data communications with the Collins Radio Company in 1957, specializing in Data Modem Development. Subsequent activities included security device, data communication system, and large scale message switching system design and implementation. He co-founded Marshall Communications in 1966, which specialized in message switching and large-scale distributed network systems products. Marshall Communications became part of Control Data in 1969, responsible for corporate data communication product development. He served as Vice President and General Manager of this division until his assignment as the executive in charge of corporate product strategy, computer group, prior to his current assignment.

Magda Mourad received her BS and MS in Computer Engineering from Alexandria University, Egypt in 1974 and 77. She is about to present a thesis to obtain her Doctor of Engineering Degree from the Institut National Polytechnique de Grenoble.

C D O'Brien graduated from Carleton University with a Master of Engineering in 1975. When he joined the Communications Research Centre he participated in the development of software and hardware techniques of a number of patents in the image communications area. Mr O'Brien has been one of the prime researchers in the development of Telidon and is presently Program Manager of System Design.

Seiei Ohkoshi received B.Eng. and M.Eng. degrees in electrical engineering from Keio University, Tokyo in 1970 and 1972. He joined the Electrical Communication Laboratories of Nippon Telegraph and Telephone Public Corporation (NTT) in 1972. From 1972-78 he was concerned with the development of electromechanical switch and PNPN crosspoint arrays. Since 1978 he has been engaged in the development of the CAPTAIN system at the Engineering Bureau of NTT.

Robert Park is a Senior Consultant with the Inter-Bank Research Organisation which is funded by the London and Scottish Clearing Banks to study matters of common interest to them. He has been with IBRO since 1974 and has worked on a wide range of banking issues, specialising on the economics of payment systems, and more recently on how banks might exploit developments in information technology. Before joining IBRO he worked for the Greater London Council, having started his career at the British Steel Corporation.

Douglas Parkhill is currently AssistantDeputy Minster (Research) for the Canadian Department of Communications responsible for Canada's largest government communications R&D activity. He came to the Department in October 1969 from the MITRE Corporation of Bedford, Massachusetts, where he was Head of Satellite Communications Systems Department. He led many major policy and technical activities concerned with communications satellites, computer/communications systems, command and control systems and telecommunications. It was under his general direction that Telidon was developed and he has overall responsibility for this important program. He received his BaSc in Electrical Engineering from the University of Toronto in 1949, and an Honorary Doctorate in Engineering from the University of Ottawa in 1971.

Chris Powell graduated from the London School of Economics and went as a trainee to Hobson Bates, where he was Account Executive on Pet Foods and Nabisco. He joined Waseys as Account Supervisor on Gallahers and Quaker. He joined BMPU as Account Manager on Smash. He was appointed to the Board of BMPU in 1972 and became Joint Managing Director in 1975. He is a member of the Training and Education Committee on the Inst. of Practitioners in Advertising.

P J Ruiten joined the Netherlands PTT after completion of his studies at the Institute of Technology, as chief of the Projection Department of local cables. He was later appointed Chief of Installation and Maintenance of telephone equipment in the Rotterdam telephone district. In 1975 he moved to the Employment Conditions and Legal Status Directorate at PTT Headquarters in The Hague. In 1978 he was appointed Project Manager for Viditel.

William Sawchuk studied at the University of Calgary where he obtained his PhD in Physics. Following his graduation he worked as a Research Fellow with the same University. In 1974 he joined the Image Communications Group of DOC as a Research Scientist. He has been active in development of techniques for interactive image communications over narrowband lines. More recently, he has been one of the participants in the development of the Canadian videotex system, Telidon. He is presently Acting Manager of Image Communications.

Ted Sedman is manager of the viewdata group in CAP-CPP's Products Divsion and is responsible for the development of telesoftware for a range of machines. His first involvement with computers was in the early 60's on applications for high energy physics. In the early 70's he became involved in real time systems including the use of minicomputers in a network for controlling the Concorde fatigue test. He also worked on the early development of commercial application on minicomputers and the use of micros for distributed processing.

Bill Shrimpton spent 9 years from 1960 with IBM in a range of marketing support and management positions. He has been with Logica since 1972 and was appointed a director in 1976. Having been responsible for the company's operations in business systems and consultancy he has for the past 18 18 months headed the planning of a possible international viewdata service.

Eric Somers received undergraduate and graduate degrees in the College of Communication Arts and Sciences of Michigan State University. He has produced network television programs and has won several awards for advertising and public relations projects involving print and electronic media. He is the author of many articles on communications theory and technology, and currently works in the research and development of microcomputer based electronic communications systems

M Termens gained his degree from Institut National des Sciences Appliquées in 1972 and Master of Business Administration in 1974. He joined the French Administration of Telecommunications in 1975 to participate in different marketing and economic studies in the development of public data communication services. During the last two years he has been Marketing Manager of the French videotex field trial in VELIZI and recently head of commercial relations with the professional market of Télématique.

Harold Toze graduated in Physics and has an M.Sc. in INformation Theory and Systems Engineering. He has worked for ITT for 10 years on message switching and other system applications. He is currently responsible for systems programming and D.P. applications at STL.

Dr Troughton joined the BPO as a Technician Apprentice. He obtained a first class honours degree in electrical engineering and subsequently obtained a Ph.D. at University College London. Between 1970 and 1977 he worked on the development of real time computer systems for use in telecommunications equipment and was one of the first users of microprocessors in the UK. In 1977 he moved to a Telephone Area as a Deputy General Manager, returning in 1979 to Prestel Headquarters with responsibility for the introduction and operational aspects of the Prestel service.

Roy Williams graduated from Q.M.C. in Electrical Engineering and has worked for the last 10 years at STL on various data terminals and systems, including electronic mail. He is currently the project engineer on viewdata systems.

Rex Winsbury is Viewdata Director of Fintel Ltd, a joint subsidiary of the Financial Times and Extel, specialising in the publication of business information on viewdata systems worldwide. Previously Features Editor of the Financial Times, he later joined the management of the newspaper to help plan applications of new technology to the editing, typesetting and distribution of the newspaper, and then moved to Fintel. He is the author of several studies of the impact of computer technology on the press and of 'The Electronic Bookstall'.

Kimikazu Yasuda graduated from Tokyo University in 1958. He entered the Ministry of Posts and Telecommunications in 1958 abd from 1977-79 was a counsellor of telecommunications of the Ministry. He has been a director of communications policy division of the Ministry since 1979.

Rolf Zimmermann studied Electrical Engineering at the Technical University of Aachen receiving a Ph.D. degree on automatic recognition of handwritten characters. He joined Dornier System in 1973 where he is now head of the Systems Engineering Department. His personal interest is focussed on display development, man-machine communications and interactive information systems.

Information Provider Activities in Canada

Gerald Haslam
President, VISPAC

There are three key factors for information providers operating in Canada:

1. The nature of the country and its communications industry.
2. The integrated services approach to interactive communications.
3. The Telidon technology

Canadian IPs represent a broad spectrum of industry, government and non-profit organizations. They have formed a national association, VISPAC, and are actively involved in four announced videotex field trials across the country.

There are, in my view, three key factors relating to the development of videotex in Canada which make the situation of the Canadian information provider slightly different from that of his counterparts in other countries:

1) The nature of the country and its communications industry.

Canada is a nation of 23 million people, most of whom live in a ribbon of population 4,000 miles long and about 100 miles wide. Along this ribbon there are significant differences in climate, culture, topography and economic activity, so that Canada, in terms of information flows, is not really a national market, but more a series of regional markets which have some things in common, but a great many facets of life which are different.

(By way of example, Canada has only one daily newspaper which distributes significantly beyond the area where it is published, but has more than 100 local and regional newspapers. The country has 1,045 television stations, and 965 AM and FM radio stations. No two have exactly the same programs.)

Next, Canadians are served by 11 principal companies providing telephone service, each on a territorial monopoly basis, some owned by government, some privately-held. Hence there is no national PTT and therefore no single approach to new developments.

As well, Canada is heavily served by coaxial cable for delivering community antenna television. In the principle urban centres, more than 85% of homes can receive cable service.

In a videotex context, this means there are two available means of delivering interactive services to the home, each in potential competition with the other. It also means that there is no single videotex trial in Canada, but rather a number of trials run in different places by different people.

At the time of writing this paper, four videotex field trials have been announced in five Canadian provinces, involving placement of terminals in as many as seven different cities. I expect that up to three more trials may be announced in a matter of months: quite a challenge for the information provider, who, if he wishes to participate in videotex on a national basis, must be prepared to operate right across the country, and with a significant variety of material to suit different markets.

2) The integrated services approach to interactive communications.

If Canada's sheer size and variety of markets is a considerable challenge for information providers, a second factor is just the opposite.

In three of the four interactive communications trials planned to begin this year, consumers will be offered not simply videotex content, but also a package of home security services: remote monitoring of intrusion alarms, smoke detectors and medical alert buttons. Market demand for these services, and their economic viability, has already been established in a number of locations in North America.

The implication is this: much of the two-way network cost for providing videotex in the home can be applied to these other interactive services, thereby increasing the odds that videotex can be supplied at a reasonable price to the consumer. That, in turn, means an enhanced opportunity for more rapid market penetration, a clear motivation for involvement of information providers.

3) The Telidon technology

Canadian IPs also have the advantage of operating with a highly sophisticated and very flexible videotex system. Like those in other countries, we have been on a steep learning curve, but we can now see the Telidon Mark 2 Information Provider System as an ideal vehicle for efficient use by the information provider. The capabilities of the full system are very considerable:

a) Telidon is highly adaptable to automation of both generation and update, and functions well in a variety of computer assisted preparation applications. That means a lowering of production costs to the IP in at present a highly labour-intensive field.

b) Telidon is well-known for its superior graphics. But for the information provider, that means the ability to design pages to meet demand. For example, Telidon today gives you choice in the order of appearance of material on the screen, provides animation, multiple overlays, colour variety and high or low resolution. It has the capability for using pattern recognition techniques in the acquisition of photographic images and highly-detailed artwork, as well as flexibility of search on either a tree structure or key word basis.

c) In terms of access to markets, Telidon is again a flexible system. Despite its greater capability, the user terminal is price competitive in market volume with other systems around the world. It can receive data from a variety of networks: paired wire, coaxial cable, satellite, broadcast, and fibre optics. In addition, it can offer downward compatibility, as well as the option of upgraded resolution. The system can be made available at varying levels of sophistication, and at varying prices, depending on market need.

What does all that mean to an information provider? To answer that let me suggest as a premise that no one in the world is sure today in just what form videotex will develop into a mass market medium. So the kind of flexibility that we in Canada have with Telidon means that we can adapt to virtually all the videotex options, all within a compatible system. And in straight commercial terms, that's a tremendous advantage.

Having outlined the context in which we operate, let me now give some details of information provider activity. The four announced videotex trials have attracted some 35 organizations from all regions of Canada at the time this paper is written; included are publishers, educational institutions, travel and entertainment companies, libraries, broadcasters, retailers and public service organizations. This is a broad base which I anticipate will get larger as time goes by.

Information providers have formed a national association, called VISPAC, to represent their mutual interests and promote the orderly growth of videotex across the country. We perceive that there are and will be a number of short term and long term issues of vital importance: while in the short term IPs are primarily concerned with matters relating to field trials, we are acutely conscious of the need to help develop this new industry in a rational and socially responsible way.

VISPAC has also been active in the formation of IVIPA, the International Information Providers Association.

In Canada itself, the IP community is gearing up for the field trial phase of videotex development. It is of course difficult to be precise in advance, but it is entirely possible that 100,000 or more pages will have been created before this time next year. One field trial begins in the spring of 1980, three more in the autumn. There is a considerable degree of secrecy between information providers concerning exactly how many pages of what kind the various organizations are preparing. But the nature of the information provider enterprise is quite similar to that in Great Britain: some IPs are preparing only their own content, while others are preparing material on behalf of organizations which choose not to set up their own videotex operations.

When the various Canadian field trials begin, I anticipate a very wide variety of content to be available, going well beyond the provision of pure information to a truly interactive involvement of the consumer in a transactional process. We won't know exactly who has done exactly what until the day when each field trial begins, but since Canadian IPs are conducting themselves in a free choice, highly competitive environment, I think we are likely to see some excellent material, even though there may be some duplication. We

also anticipate a very significant amount of government information to be placed on the systems, primarily through private-sector IPs, since videotex lends itself clearly to the provision of government material to citizens, particularly in a country the size and shape of Canada.

Finally, what of the future? Like IPs in other countries, we in Canada are also members of that new eternal triangle: system operators, set manufacturers, and IPs. We want field trials to be expanded and public service to be offered, and the sooner the better so we can recoup our investments. But we recognize too the experimental nature of videotex. Most of us are involved because we see either a threat to or opportunity for our present activities. Like others around the world, we enjoy being pioneers and we're highly optimistic about the future of videotex. Through our association, we are involved in the Canadian Videotex Consultative Committee, which advises the federal government on coordination of the industry. The result, we hope, will be development on an orderly basis across the country.

In Canada, as elsewhere, there are a great many unanswered questions about videotex, questions which will gradually be answered as we go through the process of trials and then public service. From the point of view of information providers, we are of course vitally interested in knowing:

- precisely what kinds of content are most valuable for consumer and business applications?

- exactly how much are consumers willing to pay for looking at videotex material?

- how soon will banks, travel companies, direct mail operations and other retailers see videotex as a worthwhile, cost-efficient medium?

- in a mass market sense, what form will videotex hardware take: will we continue to use the home television set as the screen, or will a separate unit evolve; will existing paired wire be used for transmission, will it be coaxial cable; what will be the impact of fibre optics?

- can international standards be developed to permit the growth of a truly international industry?

As I said earlier, we in Canada are fortunate to have a technology which offers us enormous flexibility in adapting to the answer to these and many other questions. It goes almost without saying that we have been encouraged and excited by developments in other countries and look forward to further international cooperation.

APPENDIX

Objectives of the

Videotex Information Service Providers Association of Canada

The objects for which the Association is established are:-

a) The promotion, development and representation of the interests of its members with regard to their involvement in the Videotex industry and similar Videotex systems;

b) To provide for the exchange of information between members;

c) To promote standards leading to compatability of videotex systems;

d) To encourage the unrestricted flow of electronic information;

e) To promote the protection of the intellectual properties of information providers (e.g. copyright);

f) To stimulate the growth of videotex systems which are economical and easy to use;

g) To ascertain the views of and provide facilities for conferring with and for encouraging the exchange of views of all Videotex information providers in relation to all matters which may affect their interests whether directly or indirectly and to communicate with Government whether national or local, the Legislature and any public body or authority or any other person or institution in relation to any matter which may affect the interests of the Videotex information providers whether directly or indirectly;

h) To develop and maintain standards of conduct which are in the public interest and the interests of the Videotex industry as a whole. To advance public education as to the uses of the Videotex industry and to educate those who are involved or interested in the Videotex industry in all aspects of the industry;

i) To propose equitable forms of contracts and other documents used in the Videotex industry and to promote the adoption of such forms of contract.

TELIDON AND EDUCATION IN CANADA

Peter G. Bowers
General Manager, Operations

Maria Cioni
Telidon Project

Ontario Educational Communications Authority (OECA)

Canada

As an educational broadcaster, the OECA is using its broadcast network (TVOntario) to test different carriage modes of Telidon. OECA is the only agency attempting to develop both interactive and broadcast modes in an integrated way. Participation in a variety of field trials is discussed and objectives described.

Through broadcast or interactive modes of transmission, it is the OECA's intention to make provision for a wide range of educational and general services. The potential of Telidon for educational uses is explored and examples of possible services discussed.

1. INTRODUCTION

It is a pleasure to be at the Viewdata conference to share with you the work that is being done by the Ontario Educational Communications Authority (OECA) with Telidon and education. The work we have embarked on is unique, for OECA is one of the very few agencies who are undertaking to develop educational applications for a videotex system in any major way.

By way of introduction: The Ontario Educational Communications Authority is a crown corporation in the province of Ontario whose policies and directions are determined by a 13-member Board of Directors appointed by the Lieutenant-Governor-in-Council.

It is our legislated responsibility to produce and distribute programs and materials in the educational broadcasting and communications fields, and to engage in research in these fields. OECA's mandate is to provide educational opportunities to all residents of Ontario, regardless of age, level of education attainment or location within or outside conventional educational institutions.

We work in cooperation with schools to produce materials that are in accord with their curriculum and supportive of their teaching programs. We also work directly with people at home who are not part of any formal educational process.

With our mandate for educational communications, we naturally took an interest in the potential applications of videotex for education. With our distribution system in place, which consists of nine broadcast transmitters; with a production capacity in operation including producers, educators, writers, and researchers; and with a network of contacts with educational institutions, we are well positioned to undertake this investigation.

Our initial exposure was to the British teletext system. About four years ago, we looked upon teletext as a useful adjunct to our educational television activities. We were stymied, however, by the lack of available 525 line NTSC technology and the lack of interest amongst other North American broadcasters.

We were heartened by the announcement of ANTIOPE which seemed at the time to be more readily adaptable to NTSC. We were just on the verge of starting a field trial when in August 1978, the Department of Communications (DOC) unveiled Telidon, Canada's alphageometric Videotex system.

Telidon forced us to reappraise our expectations for teletext applications. With high resolution graphics available we now looked on Telidon as an educational medium in its own right. It also made us decide to look at all modes of delivery: telephone, cable television, broadcast, and even physical delivery.

The work we have embarked on since then is unique in a number of respects. OECA is one of a very few agencies undertaking to develop educational applications for Videotex in a major way. Also we are the only agency to our knowledge that is attempting to develop both interactive and broadcast modes in an integrated way. Our broadcast field trial is underway right now.

2. FIELD TRIALS

The OECA field trial is a composite experiment consisting of:

- a broadcast Telidon trial
- an interactive Telidon trial
- participation in the Bell Vista trial
- participation in cable Telidon trials.

A total of 55 Telidon terminals, operating in both the interactive and broadcast modes will be deployed in schools, colleges, universities, libraries, science museums, and individual homes. The initial aim will be to expose educational information providers to the system and encourage them to create educational content. Some public exposure will be obtained through libraries, museums, and home use.

The TVOntario educational network broadcasts 16 hours per day, 7 days per week and potentially covers about 85% of Ontario's 8.3 million people, utilizing 9 television transmitters.

The broadcast trial started January 11, 1980 and is operating during network hours. By April, we anticipate a nominal page capacity of 300 to 500 pages with about 20 percent devoted to OECA purposes.

The remaining pages will be used by other educational institutions and information providers in order to provide a broader spectrum of service. For example, a broadcast cycle could include: news, weather, financial markets, sports, etc. We do not intend to carry information of a non-educational nature, once other broadcasters start offering general teletext services. In terms of information related to OECA's activities, we would carry program listings, organized by time but also by subject area, program notes and teachers' guides, program prospectuses and so forth. News concerning education such as school bus status, school administration, and educational job opportunities would be carried. Other educational institutions will provide pages concerning their course offerings, course registrations, correspondence courses and other distance education.

In addition, we intend to offer Telidon materials directly related to the television program. Captioning for the hearing impaired, and multi-lingual subtitles are simple examples. However, we believe that methods will be found where each medium reinforces the other in terms of conveying learning experiences.

In addition to integrating Telidon and television we intend to interrelate the broadcast and interactive modes of Telidon.

The 55 terminals noted above will be able to access a 10,000 page computer facility in Toronto via telephone circuits. This arrangement will enable us to explore the advantages of the interactive mode and to examine the interrelationship between it and the teletext mode.

The information content of these interactive trials will tend to be all educational, since users will hopefully have access to other data bases with generalized information. Later on, we will describe some of the interactive applications we foresee. We believe they will tend towards information retrieval, computer assisted instruction, computer managed learning, heavier use of graphics and symbols, and the involvement of educational institutions in the mediation of learning materials.

In the near future we are slated to participate as an information provider in the Bell Vista trial, which is described elsewhere in this conference. Bell will be utilizing 1000 interactive terminals and a 100,000 page computer to be located in Toronto. In addition to creating content for the Vista data base, we anticipate acting as an umbrella IP for smaller educational institutions in the Vista trial. We are hopeful that our 55 terminals will also be able to access the Vista data base.

Finally, we have reached agreement in principle to participate in the Canadian Cablesystems Telidon trial. Cable television systems in Canada, with penetrations in the order of 67 percent of urban populations represent an interesting viable alternative for the distribution of interactive and broadcast Telidon. By utilizing the vertical interval on one of their cable channels, they can duplicate a broadcast Telidon system. By using a full television channel they can step up the transmission rate by a factor of 250 over teletext, assuming they have the computer capacity. With the advent of two-way cable, they can offer interactive services.

3. OBJECTIVES OF THE FIELD TRIALS

With such a brand new technology and with very little experience in terms of applications of public information dissemination systems, our field trial objectives are diverse and wide ranging.

We hope to find the answers to a lot of questions; questions in technology, management of information, development of educational applications and the evaluation of user response.

3.1 Technological Objectives

In the technical area we are using the TVOntario broadcast network to transmit Telidon in the teletext mode. We are working with DOC to determine the optimum data transmission rate under North American television system propagation conditions. TVOntario transmitters operate at UHF and VHF frequencies in urban and rural situations, and on mountainous and flat terrain. A variety of distribution systems are used including microwave, off-air repeaters, direct broadcast satellite, and cable television.

OECA is currently conducting with DOC one of the world's first operational trials of a direct broadcast satellite. We are feeding 87 hours per week of TVOntario programming to 46 receivers in remote Northern Ontario, located in individual homes, institutions, cable television systems and a low power television repeater. We are using two new technologies, direct broadcast satellites and Telidon, to deliver educational materials to remote locations.

Initially, we are trying three different data transmission rates: 3.95, 4.57, and 5.19 megabits per second. The final choice of a data transmission rate will of course affect the number of pages that can be transmitted and the waiting times for those pages.

The rate will be a function of acceptable service areas and levels of error detection and correction.

We are also going to investigate the use of various lines in the vertical interval to transmit Telidon and other signals such as Vertical Interval Test signals (VITS), Source Identification signals (SID), and PBS Captioning signals (Line 21) on an integrated or time-shared basis. The objective is to make optimum use of the available vertical interval.

3.2 Information Management

We are concerned about several aspects of information management, in particular; creation of pages and sequences, organization of data bases, dissemination of materials and presentational considerations.

Information management appears to be the most labor intense and costly aspect of any videotex service.

Under page creation we want to look at the facility of input terminals, the provision of text editing techniques and the possibility of automatic data entry from data bases such as news, weather, commodities, etc.

Under organization of data, consideration will be given to various indexing schemes, tree structures, broadcast cycles, accessing techniques, and relative versus absolute referencing.

Under dissemination of data we are concerned not only about the logistics of the broadcast cycle but also with the interrelationships between interactive and teletext data, and the movement of data between various videotex data bases. Our intention is to use each mode of delivery to its advantage and to capitalize on the interrelationships.

Finally, under presentational aspects we will be examining the use of colors, formats, designs, waiting times, graphics, grammar, legibility, standard headers and identification.

3.3 Development of Education Applications

In the area of program content OECA is developing some materials specific to its own requirements, particularly as they relate to educational broadcasting, and noninstitutional education. In addition, we are developing sample materials for use by conventional educational institutions.

We will explore the role of the educational institution as an information provider both within the community and the institution itself. We are examining the role of the public library in providing public access to Telidon at least initially.

Educational information providers have been encouraged to regard Telidon as an educational medium in itself and to consider the design of program material accordingly. As a result, for example, less text and more graphics and 'animation' are being used to convey complicated mathematical relationships.

3.4 Evaluation

Our evaluation objective will be to attempt to get an initial user response to the technology, the software, and the applications. Although these field trials are not market tests, we hope they will enable us to lay foundations for indepth testing in future years. With a total of 55 terminals being moved through a variety of settings (homes, schools, colleges, universities, libraries and, museums) we expect to get a broad cross-sectional but preliminary respsonse to Telidon in the educational context.

4. TELIDON AS AN EDUCATIONAL MEDIUM

As was stated earlier OECA considers Telidon to be an educational medium in its own right. A number of characteristics of the system contribute to that opinion:

- Hypothetically at least Telidon could be as ubiquitous as television sets or telephones. It has, therefore, the potential of delivering educational experiences to anyone regardless of location or time.

- Telidon's interactive capability allows each learner to proceed at his own pace with periodic feedback on progress.

- Its graphics capability enables the provision of a wide range of educational subjects including for example:

  - music scores
  - charts and graphs - economics, business, etc.
  - symbols, equations - maths, sciences, chemistry
  - cartoons - political science
  - maps - meteorological, geography.

- The ability to provide pages that unfold at a controlled rate, focuses attention and paces the learning experience.

- The educational effectiveness of real live data must be noted. Information such as weather, economic reports, stock markets, news is considered very useful.

5. OECA APPLICATIONS OF TELIDON FOR EDUCATION

OECA projects a series of applications organized in order of increasing complexity.

5.1 As a Complement to Educational Television

As mentioned earlier, OECA broadcasts educational television 16 hours per day for audiences ranging from pre-school to senior citizens. Typical applications include:

- broadcast listings, including critical reviews;
- specialized schedules organized by subject area or grade level;
- program notes, teachers' guides, discussion questions and answers;
- captioning for hearing impaired or foreign languages;
- promotion of support services such as seminars, workshops, available materials;
- write-in, phone-in, and now videotex-in for further information.

5.2 As an Alternative to Conventional Print Processes

OECA currently spends about $500,000 per year on printed materials. With newsprint going up, postal rates going up and distribution times getting longer, electronic publication becomes more interesting. Lacking a Telidon terminal population out there, however, it is not yet possible to postulate a cross over point. Some electronic publications might include: catalogues, bibliographies, prospectuses.

5.3 Dissemination of Educational Information

In Ontario weather conditions sometimes cause schools to be closed or school buses to be stopped. Especially in rural areas, information of this nature is very important. Less crucial but also useful would be administrative information such as curriculum information, school registrations, educational job opportunities, appraisal instruments, etc., plus real time data such as news, weather, stocks, consumer, agriculture, and nutrition information.

5.4 For Information Retrieval

- retrieval of information from data banks
- educational research, reference materials
- bibliographic information, commercial data banks.

5.5 For Interactive Learning Programs

- Correspondence courses could be individually paced. Responses to tests and examinations could be keyed in.
- Computer assisted learning programs could be adapted to the Videotex tree structure.
- Computer managed learning using ETV to present materials and CML to test students, and provide individual responses.
- Educational quizzes and games.
- Course content, exams, answers, results, diploma.

6. FUTURE DEVELOPMENTS

There are several applications of Telidon that appear to be within the capability of the technology that are not yet developed. The following would be of particular interest to educational information providers.

6.1 Telidon With Audio

The addition of an audio track would enhance the use of the medium. With voice synthesizers we could even dispense with the visual display of text. However, we are not advocating

this. Obviously work would have to be done on the tradeoffs between information capacity devoted to audio and that devoted to data. We think it would be a useful development in modes where it is technically feasible.

6.2 Telesoftware

The telesoftware concept has already been demonstrated in the U.K. We believe the concept has great potential in two respects, first in relieving the loading on communications channels, and second in delivering interactive learning packages to the user. Telesoftware could greatly enhance the "apparent" interactive quality of the broadcast mode.

By selective indexing of broadcast pages, it would be possible to have a wide range of sequences delivered only a few times a day, with would-be-users capturing and storing the desired programs.

Current microcomputer techniques using audio cassette recorders makes extended local storage a simple affair.

6.3 Full Channel Transmission

Full channel transmission after hours or on unused cable channels affords a very economical way of delivering large amounts of data. The major requirement would be a host computer with sufficient data capacity and speed to meet the demand and of course some form of automatic local storage.

6.4 Alphabetic Keyboards

The main reservation that the institutions with computer assisted instruction programs raise in adapting their programs to Videotex, is the rigidity of the numeric tree structure. It appears to be a matter of time and economics before Telidon terminals appear with full alphabetic keyboards enabling more flexible interactions with data bases.

6.5 Hard Copy Printers - Addressable Terminals

Once again the constraint appears to be economic. With hard copy printing available Videotex could be used to create tickets, coupons, receipts, examination papers, and even diplomas, although in the broadcast mode it would be necessary to address particular terminals.

6.6 Common Video Space

With Telidon it is technically possible for two terminals to communicate directly utilizing a common video space. This opens up the marvelous possibility of leaving messages for your children on the TV screen. It would also facilitate dialogues between student and teacher, joint problem solving and so forth.

7. INTEGRATED APPROACH

As educators and broadcasters we can see the need for both interactive and teletext modes. With an integrated approach you end up with a larger potential audience and a wide range of data -- assuming the financial premium of a multi-mode terminal does not inhibit acquisition. Obviously broadcasters if they remain as such, (and there is some question about the future in North America) would not be interested in selective dissemination of data. Conversely commercial information services need a payment mechanism and therefore are not interested in the teletext mode. Perhaps the interim solution is a terminal that is "plug-adaptable" to either mode until the economies of mass production take over. This way a user could at least upgrade his terminal.

What then are the relationships between the broadcast data base and the interactive data base? To a certain extent this depends upon who is going to pay for the data. Telextext data are in effect sponsored by the broadcaster, the advertiser or service agency that wishes to deliver it to the user. The interactive mode can also deliver information at no charge but it is inherently a more expensive process.

From OECA's point of view, we see teletext being used for information that is topical, transient, and of broad general interest. Conversely, we see information of a permanent nature, or more specialized nature residing in the interactive data base. We would hope that interests kindled on teletext could easily be pursued in more detail in the interactive mode. This implies cross references in both data bases. To a certain extent the teletext service could include a multi-page menu for items in interactive hosts. We would hope that data in the interactive host can be easily transferred to the broadcast host. This implies that data are formatted identically and use the same headers. renumbering of pages is undoubtedly necessary since the broadcast cycle does not require the numeric power of the interactive mode.

Given the cost of transporting data over distance (unless we use satellite) it is likely that access to a given interactive host will tend to be regional rather than national or provincial. In due course, computer centers will spring up in all regions. However, it will be more difficult for sparsely populated regions to support the cost of large host computers. Thus it may be for some time that teletext will carry information of a national or provincial nature and more regional information will be found in the interactive base.

8. EVALUATION

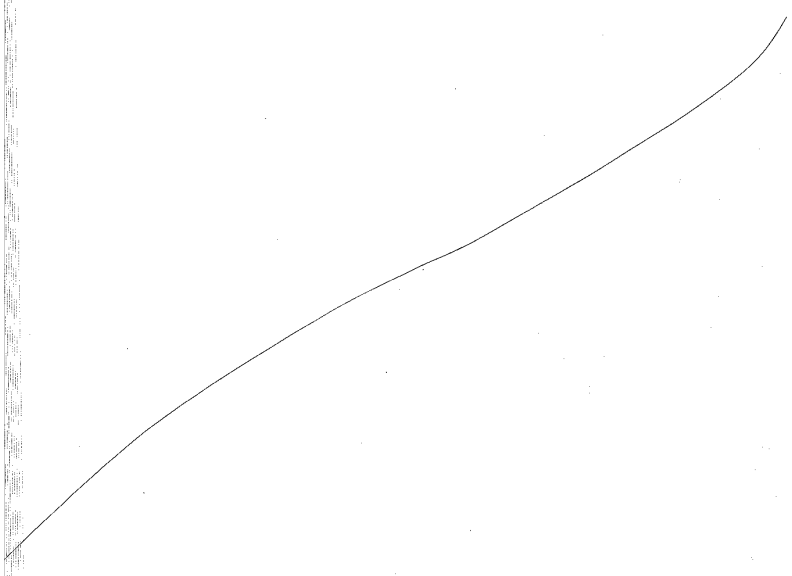
Finally we come to our intentions regarding evaluation. Bearing in mind that we are undertaking field trials and not market tests, we are not looking for rigorous results. Rather, we are attempting to develop and demonstrate a new medium, inform the public in a preliminary way and stimulate public institutions to examine their potential role regarding Telidon.

We will use questionnaires chiefly to seek people's preferences in the following areas:

- o acceptable waiting times for various modes,
- o educational effectiveness of materials offered,
- o impact on television viewing and the educational experience,
- o relevance of content,
- o organization of content,
- o types of information preferred on various modes,
- o technological efficacy of systems,
- o reliability of systems,
- o impact on institutional processes,
- o sociological impacts,
- o special applications such as captioning for the deaf.

9. CONCLUSION

We welcome this opportunity to discuss our perceptions of the potential educational applications of Videotex systems. We would be happy to establish continuing contacts with educational institutions everywhere so that we might enter into dialogue and share results more broadly.



THE TELEMATIQUE PROGRAMME IN FRANCE

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FRANCE

For many years the pundits have been forecasting the "imminent" advent of "telecommuting, armchair shopping and the chequeless (as well as cashless) society" but it is only in the past two years that such assertions have begun to appear commercially viable in the foreseeable future.

The catalyst for this renewed optimism is the emergence of Videotex in a variety of guises in different parts of the world. In France a significantly broader approach than that of simply offering large scale information retrieval facilities has been taken. Under the generic title of the "Telematique" programme a family of developments with carefully related objectives is now appearing. This paper provides a broad perspective of this programme; subsequent papers in this session feature some of the individual projects in more detail.

INTRODUCTION

Since 1975, the massive investment programme in French Telecommunications has created not only a first class telephone service but also created the opportunity to prepare new services based on the latest technology.

Under the collective title of Telematique, which aptly conveys the significant meaning of the convergence of telecommunications and computers, the following projects have been implemented :

Teletel - the French Videotex Service
Electronic Directory - a novel and specific application of Videotex techniques to Telephone Directory needs

Home Facsimile - a consumer market facsimile service
Telewriter - an interactive graphics service using narrow bandwith links

In order to illustrate their collective rather than individual strength this paper concentrates on the broader issues and inter-relationships from an application viewpoint and makes particular reference to potential opportunities outside the national services planned for France.

TERMINOLOGY

The term Telematique has already been defined but it may be helpful to amplify some of the other titles now being used in describing the several facets of the related projects :

Teletel is the "brand" name for public Videotex service being prepared in France. It should be added that the policy of the French Administration is to remain "transparent" to the information activity. As will be amplified in a later paper the PTT role will be essentially that of providing the communication links and interfaces though there will be some involvement at the "concentrator" level to assist the users (including Information Providers) insofar as general indexing and billing functions are concerned. Both PSTN and TRANSPAC (the national packet switching service) will be utilised.

Antiope is often classified as the French broadcast Teletext information service; but this is an over-simplification which requires clarification.

(i) Antiope is also the name given to display language standards common to both off-air and interactive videotex mode

(ii) Antiope also incorporates packet assembly/disassembly features (and the associated error detection/correction capability)known as DIDON

It is this latter technology which provides Antiope with the unique capability to permit separately addressed pages to be sent to predetermined receivers.

The Electronic Directory is a specific derivation of Videotex. While using common standards for display and communication it has necessitated the development of special software to provide the powerful search capability needed for this type of application. Because of its compatability with Videotex, however, Teletel users will be able to access the Directory database while users equipped with the low-cost black and white Directory terminals will be technically capable of accessing the other host databases connected to Teletel.

APPLICATIONS

A fundamental objective for the Telematique programme in France has been to ensure technical compatability thereby achieving the synergy noticeably lacking in developments elsewhere. The important part played by the jointly funded and operated TV and Telecommunications Research centre in Rennes - CCETT is a typical example of the commitment to this principle.

The DIDON technology was created there, combining the packet handling techniques developed originally for data communications in the telecommunications networks with digital transmission in the broadcast mode. The result is the ability for a single broadcast channel to carry many different information programs simultaneously; a facility not available in other off-air information systems. The combined development of off-air and interactive Videotex information systems has also resulted in the ability to mix the two services or permutate system elements of each in an extremely effective manner. Such flexibility can, for example, be readily employed to solve the technical and operational problems facing Cable TV operators in North America and other parts of the world who, naturally, are vitally interested in applying Videotex developments to their existing networks - most of which are still unidirectional. By combining the telephone facilities to provide the return path with the broadcast information service and employing the packet addressing features of DIDON, a satisfactory solution should result.

Similarly, the inherent compatibilities of the Electronic Directory service and Teletel means that the low-cost Directory terminals can be used for Videotex services eg. if terminal costs outweigh the value of colour. It is worth noting at this juncture that both these services will utilise alpha-numeric keyboards from the outset thus ensuring still greater opportunities for transferring these technologies to other applications.

An interesting example of these potential applications can be seen by considering the Electronic Directory systems. For this operation the software has utilised an inverted file structure so that enquiries can be made using either the address details, the business classifications or, if the address is the required information, the telephone number can be keyed in. It requires little imagination to visualize other applications which could benefit from this system; many files exist where name/address details and identification codes (in place of telephone numbers) form the basic search parameters. The name/address fields could equally well be replaced by stock headings or catalogue items. With full alphanumeric and keyword search capability already available the Electronic Directory software could be readily adapted to these applications.

It is for this reason that this development is creating so much interest in commerce and industry as well as among Telecommunications Administrations. Coupled with the planned availability of a low-cost terminal and with the compatibility of the French Teletel terminals which could therefore be used as dual purpose terminals to serve this need also, it opens up a range of very attractive new business opportunities.

OTHER TELEMATIQUE DEVELOPMENTS

At the beginning of this paper reference was made to the Home Facsimile Service and the Telewriter.

While both are being developed by French industry to cater for specific market needs, they are also relevant in a supportive role for Videotex. Looking to the future one can see them playing an important part in low cost "office of the future" packages to use a somewhat ambiguous term. Certainly it is expected that they should be affordable by small businesses and even appear in the homes of professional people who are keen to adopt "Telecommuting" solutions.

The telewriter is able to satisfy the needs for inter-active (virtually realtime) graphic and manuscript dialogues; it can be used over unconditioned lines quite satisfactorily with alternate speech and offering up to seven colours plus partial or full-screen erase facilities.

The low-cost facsimile terminal is a transceiver device which, like the Telewriter, uses a small segment of the normal speech bandwidth of the switched telephone network. It will receive in the unattended mode and has the additional benefit of providing photocopying facilities. This, combined with its low cost, should ensure its success as a consumer product rather than remain in the professional sector only.

With suitable enhancements it is conceivable that these devices can be adapted to interwork with the Videotex service in France in order to provide a powerful low-cost package for the smaller businessman who hitherto has found difficulty in affording such aids. Additional features such as intelligent terminals using floppy disc and micro processor options are already under development; these will add another layer of sophistication as an optional extra.

FOREIGN MARKETS

It will be apparent from the foregoing paragraphs that considerable scope exists for supplying these developments to the private sector as well as to other national Administrations.

Similarly, the versatility and inherent compatibility across this range of products facilitates modification to meet the needs of specific applications. The links which exist between the French Administration and French Industry ensures a wide range of expertise to tackle the needs of novel applications.

This underlines one other valuable aspect of the French attitude to overseas collaborations. All too often, customer organisations find their potential supplier can only offer that version of the product developed for the home market and is either unwilling or unable to modify the system to suit the clients' needs. This is not the case with the French Telematique products; opportunities now exist for experimentation and trials which can result in more suitable versions for clients. For example, special developments are already in hand within French industry to provide either "stand-alone" Videotex systems for users wishing to operate inhouse systems or use a Videotex compatible front-end device to interface with their existing main frame.

To strengthen these links with foreign markets, the French Administration has now created a company to act as a liaison between potential clients and these French developments.

This organisation is the "Société pour la Promotion Internationale de Télématique" (SOPRITEL). It will be active in promoting and offering advisory/consultancy services as well as providing a focus for foreign interests in Telematique developments. It is empowered to enter into experimentation and other collaboration with foreign organisations and to look for assistance and expert advice from the Directorate General of Telecommunications, CCETT et al. Close liaison is also maintained with SOFRATEV who have similar responsibilities in the Teletext/Antiope area.

SUMMARY

It is not possible to cover all the details relevant to the Telematique programme in one paper. The main purpose has been to point out the collective strength of these related developments. Subsequent papers in this session will examine specific services in more detail but some of the more important attributes of the Telematique programme could be summarised as :

- Overall compatibility
- Low cost - massmarkets
- Design flexibility
- Collaborative opportunities

Thus while it is important to consider the merits of the individual products and services, it is their de facto complementary structure which could offer unique benefits in the world markets as well as in France.

TELETEL, the planned French Videotex Service

M. TERMENS - D.G.T.

This paper is concerned with the French Videotex Service which is now called TELETEL.

First the terminal configurations. It comes in two different versions :

- It can either be a decoder/modem/alphanumeric keyboard assembly allowing the family television set to be connected to the telephone network ; this assembly can be external to the television or incorporated in it ;

- Or be a complete terminal, comprising a screen and a keyboard, not only having numerical keys but also all the letters of the alphabet which is particularly advantageous for the applications for which it is intended.

French policy regarding VIDEOTEX/TELETEL can be summarized as follows :

First of all, a spontaneous action on the part of the Telecommunications Administration which should result in making available on a free-of-charge basis a small - black and white display terminal for all telephone subscribers ; this lowcost terminal would be used to obtain information given at present in the printed directories - this is what we call the "electronic directory".

Secondly, this policy relies considerably on experimentation. Two experiments are in fact in the preparation phase :

- the first concerns an entire French "Département" and consists of supplying by videotex some 250 000 telephone subscribers of this "Département" with the equivalent service of the paper directory, starting at the end of 1981 ;

- the second experiment, on the other hand, will involve a much smaller number of users - about 2000 to 2500 households living in the Paris region - but to be implemented as of the end of 1980 by supplying these households with several services which are described later.

The first service to which special attention has been given in France is the one we call the "Electronic directory". It provides electronic access to all the information normally found in the white and yellow pages of the printed directory.

Indeed, we believe that the electronic directory should afford considerable improvement in the information function of the subscriber due to in particular, a much faster update of information than is possible with paper and we have calculated that from the financial viewpoint this would not cost the Administration any more in the long run to supply a terminal free of charge to all telephone subscribers along with the associated data processing service for the cost of a local call than to continue printing the directory on paper.

Of course, several obstacles still remain to be overcome, in particular as regards the man-machine dialogue because we want this service to be used without training at least by all those who today know how to use a paper directory.

It is for this reason that an experiment involving a large population is absolutely necessary. It will commence, as I said earlier, at the end of 1981 in the ILLE et VILAINE Departement located in Western France. If the results of this experiment are satisfactory, the service will be progressively extended to the entire country over about 10 years, which will lead to putting about 30 million electronic directory terminals into service between 1983 and 1992.

In order to test the other services which can be supplied thanks to videotex, a second experiment is being prepared.

This one will start at the end of 1980 in the Paris region in a town called VELIZY with about 2 000 to 2 500 households and will last at least 18 months.

150 to 200 service suppliers will provide numerous and diversified applications using either their own computers or a local data base implemented and managed by the PTT to facilitate small suppliers participation but which will disappear at the end of the trial.

These applications will include not only information access services for sequential or direct search but also associated search by means of key words. For this first application category, the following can be mentioned :

- consultation of bank statements ;
- practical guide of rights and procedures ;
- local information supplied in particular by press angencies and publishers.

But above all we shall also offer message exchange services of the "mailbox" type between subscribers, in other words individual to individual, individual to company, and company to company, and such transactions as :

- orders to mail-order companies ;
- seat reservations, in particular seats on trains, and for shows and package tours.

And finally payment services for which it should be noted that certain terminals will be equipped with stet readers making payment operations possible with all the desired guarantees with regard to security.

To conclude this briefing on general public use of videotex in France, let me summarize by emphasizing the specific points of French policy.

The French approach is characterized as we have seen by three particular points :

- first of all, the existence of a specific action by the Administration on one application : the electronic directory, with the important result, in the eyes of videotex users, being a terminal free of charge. That policy could have of course as an important consequence the braking of the development by manufacturers equipped with videotex facilities or of external devices separate from the TV receiver.

However, if on the other hand the reluctance of the user is due to the high price of the terminal, the market will be open to the Information Provider, which could encourage the marketing of a complementary set, a second one, more sophisticated than the director terminal.

- The second point lies in the implementation of control keyboards comprising letters of the alphabet from the outset which provide fundamental advantages by increasing the range of the services possible.

- The third, also very important, is the deliberate adoption of the tradional role of the Administration of telecommunications. This role is limited to the supply of communication means, each service supplier being able to use his own computers and administer his own data base with direct access through the telephone network in order to receive and process local calls, or with access to TRANSPAC data network, for trunck calls, the cost of transmission being by this way independant from the distance. This requires of course, the adoption of the databases to the videotex protocol. At the end of 1980, there will be hardware and software avalaible enabling this adaptation.

Finally, as soon as the videotex terminals intended for the general public are available on the market in sufficient quantities - in other words as of the end of 1980 - companies will be able to create or extend internal data networks to which these same terminals or similar versions adapted to certain special professional applications will be connected.

Many applications which are not yet in widespread use today owing to the cost of terminals will become available within the same geographical location or between various establishments. Among these applications, mention can be made of the following :

- file consultation ;
- management (stocks, orders, invoicing, accounting, etc...) ;
- internal exchange of electronic messages.

There are already several companies in France which are working on these specific professional utilizations, of videotex.

It is hoped that this paper has clarified those essential aspects of French policy with regard to videotex and the specific arrangements for TELETEL and the VELIZY trial.

Development & Applications of the Antiope-Didon Technology

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The French Antiope teletext has now been on the air for almost 3 years in France : a full public service has been implemented, and will be promoted in the near future by industrial production of VLSI component equipment.

Teletel-Teletext full compatibility in terms of display processing makes Antiope products the best suited to the present new developments aiming at teletext message delivery on broad band channels, in low-cost business or specific audience applications, especially in the United States.

The French ANTIOPE system was reportedly developed as a unique visualization process, aiming both at video broadcast one-way information display and at interactive data retrieval and display via the switched telephone network.

The narrow band two-way communication service is called TELETEL : in this mode, the ANTIOPE decoding unit of the user's terminal is connected to a data base via a telephone line through classical telephone modems, currently 1200/75 bauds, using dedicated logic circuitry.

For ANTIOPE teletext wide band delivery, the same ANTIOPE decoding unit is fed through specific demodulator and demultiplexer circuits called DIDON.

After a brief description of the main technical features of DIDON and ANTIOPE, this paper describes the services now on the air in France, future developments based on actual marketing in France and abroad, especially in the United States, and decoder mass production schedules.

1. DIDON DATA TRANSMISSION PROCESS

The main features of the DIDON transmission process are its complete independence from the bit frequency, and its ability to use any video line within the frame. DIDON transmits one data packet per video line : it is completely transparent with regard to the nature of the data. This means that ANTIOPE teletext alphamosaiccodes are only one example of the kinds of data that DIDON can transmit. In fact, any kind of digitally coded message can be transmitted via DIDON, and the useful data flow can exceed 4 Mbits/sec in full channel (625 line standard) capacity (2.8 Mbits/sec in 525 line standards), i.e. when the entire video channel is filled with data packets.

This feature allows the distribution of ANTIOPE codes either on any small number of video lines within the blanking intervals, together with the regular TV program (like Ceefax and Oracle), or on a full video channel : on the air or on cable. In the United States, for instance, Multipoint Distribution Systems (MDS) are devoted to pay TV at 2 GHz in over 100 of the largest American cities : these channels might also be very useful for ANTIOPE teletext broadcast either with spare channel capacity during pay-TV hours (from 5:30 p.m. to 2 a.m.), or with full channel capacity during business or other night time hours.

Cable TV stations might also make use of the Didon full channel capability for teletext transmission as well as for any other data packet delivery.

2. ANTIOPE ALPHAMOSAIC DISPLAY PROCESS

Didon's features free ANTIOPE coding and editing from any constraints with regard to the length of a video line, or anything else. Thus, for alpha-

mosaic display, ANTIOPE codes are sent in the same way as for an ordinary telex, with line feed and carriage return character codes. The parallel attribute configuration on 16 bits per character, instead of 8, makes a completely logical editing procedure possible. Each character code is closely associated with its color, background color, and flashing attribute, double width, double height, inverted background, etc., whether the characters are separate or contiguous, alphabetic or graphic, upper or lower case. Up to 16 different alphabets may be visualized on the same display, namely French, English, German, Cyrillic, Arabic, as well as any other alphabetically structured language.

3. ANTIOPE-DIDON BROADCAST QUALITY

In DIDON, Hamming codes in the header of each data packet provide optimal error protection,

In ANTIOPE messages, a parity check is available for each byte. Broadcast teletext could in fact lead, in difficult reception conditions, to a complete loss of characters, even to missing lines if special redundancy and error correction procedures were not implemented. Extensive field measurement tests have been run on VHF or UHF transmitters in France, Switzerland, Holland, and more recently in the United States on CBS's Saint Louis transmitter. The overall results are excellent in terms of average error rate. The conclusion of these field tests is that acceptable ANTIOPE teletext conditions exist even when TV program quality is rather poor. In extremely bad reception areas, special error correction devices associated with enhanced antennas may solve the worst problems.

4. ANTIOPE MARKETING IN FRANCE

A technical test period enabled Télédiffusion de France to appraise and improve ANTIOPE and Didon standards until 1977. At that time, a pre-operational service was started in Paris, together with the "Compagnie des Agents de Change". This was the beginning of Antiope-Bourse, the stock exchange service, as well as of TDF's teletext expertise. Since May, 1979, a complete teletext public service is on the air, with seven different magazines on four TV networks. Eight more magazines will begin to be broadcast before the end of this year, each editing between 50 to 300 pages. Three of the networks are the national television networks, TF1, A2 and FR3; the last one is a regional one partly devoted to local community ANTIOPE teletext services. Each one can broadcast approximately 100 teletext pages either on a national basis or for regional coverage (FR3).

An interesting point in France is that the old VHF black and white 819-line network is being phased out of service, and it is possible to dedicate it to specific audience programs, for instance full channel teletext. A total of 6,000 pages are available on this one VHF channel, with an average access time of under 10 seconds.

4.1 ANTIOPE-BOURSE (STOCK EXCHANGE)

In July of 1977, the stock exchange IBM computer was hooked to an ANTIOPE multiplexer through a buffer. Since then, an increasing number of dedicated stock market pages have been put on the air each day. Up to 80 pages a day were transmitted on an experimental basis until last October. Now the ANTIOPE stock exchange service is on the air with over 350 pages on the VHF dedicated network operated by TDF. A few thousand stock quotations are thus available in real time, from foreign countries as well (100 pages). The immediate broadcast and large audience for this data makes this service one of the best suited to broadcast teletext.

4.2 OTHER ANTIOPE SERVICES

Other ANTIOPE services are now on the air over the four different networks :

"ANTIOPE-METEO" (weather report) has been on the air since October, 1978, with 25 pages, then 80, and will increase to 150 by the end of this year. An audience marketing study proved the interest of such a magazine among specific categories of the public : transportation businesses, tourism, civil works and agriculture seem to be extremely interested.

"ANTIOPE-POSTES" (postal information) is now a 50-page experimental magazine on air for post office staff. It will soon become a public service for general information in all French post offices, thus making a large audience accustomed to this new communication device.

"ANTIOPE-OREP" (local community news and information) is on the air as an 80-page experimental service for the public in the southwest part of France over FR3. Manual editing by the Permanent Education Regional Office brings together employment advertisements, university news, town hall administrative information, etc.

"ANTIOPE-ANTENNE 2" is a service broadcast nationally by the A2 network. It provides 60 pages of information connected with the TV programs and, at the same time, has enabled A2 to gain considerable practical experience with this completely new programming medium after six months of operation.

"ANTIOPE-CRICR" (road conditions) on the VHF network is as yet only a few pages, and is now operational in the south of France near Marseille.

"ANTIOPE-ALPES DE HAUTE PROVENCE" is a 60 to 80-page magazine of local information on the FR3 network.

Other services are to come during 1980, and a total of one thousand pages should be on the air by the end of the year. The philosophy underlying TDF's marketing is essentially oriented toward data which suffers from lack of circulation, or poor circulation.

The number of decoders now in use is 500, but will soon be a thousand. The first LSI circuits will be available on an industrial basis in a few months, and this will rapidly increase the number of ANTIOPE teletext users, since a public service is already on the air.

5. ANTIOPE BROADCAST TELETEXT DEVELOPMENTS

There has been considerable development at the CCETT in Rennes since the teletext standard was first tested. This activity is now closely related to a strong marketing policy.

Sofratev, an engineering subsidiary of TDF, is responsible for marketing ANTIOPE-DIDON technology abroad. The first opportunity happened to be the interest in teletext expressed by the CBS network in the United States. As the ANTIOPE equipment was perfectly adaptable to the U.S. NTSC 525-line standard, TDF was able to deliver teletext equipment in February, 1979, to the CBS laboratories. ANTIOPE was on the air at KMOX Saint-Louis in March, and the first field tests began in May of 1979. A demonstration was held last September of ANTIOPE's excellent performance in the U.S. standard.

5.1 NEW BROADCAST TELETEXT DEVELOPMENTS

Since then, ANTIOPE development was fully supported by the technical interaction between American and French engineers.

5.1.1 The idea that teletext, associated with a TV program, would be too limited for mass audience interest in the U.S. led to different concepts. The most evident improvement is the use of a multiple page local memory for the decoders in order to eliminate access time problems at least after the first cycle. The first model multiple page memory decoder was experimented a few months ago in France with a 50 to 60 page memory. It has since been demonstrated in Toronto (SMPTE), and may be seen at Viewdata 80. One of the VLSI circuit manufacturers in France has already included such operational features in its design of ANTIOPE circuits.

5.1.2 The selective access process in broadcast teletext has proved to be one of the most profitable features for future use, either for mass audiences or for business applications. CCETT developments with regard to secrecy and/or subscription teletext are now quite near completion. A magnetic card system will key the access in an initial development; electronic cards will follow as soon as they are available on the market.

5.1.3 The possibilities of teletext closed captioning for the hearing-impaired and for foreigners are well known and were first experimented in the United Kingdom. The problem of synchronizing the TV program and the captions was not really solved, except at the price of heavy time delay constraints. If several different languages are to be captioned at the same time with a given TV program, new developments are needed, because asynchronism

appears for multilanguage captioning applications. The new standards make it very simple to add sophisticated captioning options to a normal teletext decoder : in this new process, the synchronism control signals are completely separate from the "character attributes" - they are actually considered as a "message attribute".

The same ANTIOPE feature will lead very simply to :
. sophisticated display animation
. combination of alphamosaics, alphagraphics and even chirographics on the same display in a completely compatible evolution from the elementary low-cost teletext decoder to the most sophisticated version.

The idea behind this process is very simple : it is better to give the system the ability to combine different languages in an evolutive process than to try to design the most sophisticated language to meet all the requirements. The reason is that we do not yet know what these requirements may be.

The ANTIOPE "article" concept described in the paper delivered by Mr. Marti of the CCETT provides the technical capability. This concept is particularly interesting because the present standards and equipment are completely compatible with it, since default options are provided.

These ideas recently led some PBS stations in the U.S. to express interest in ANTIOPE-DIDON technology, especially with regard to mass audience field tests in the educational area : animation, captioning, combination of high quality graphics and teletext with hand-drawn designs are highly desirable features for such applications.

5.1.4 High quality graphics are now available in ANTIOPE technology. Software alphabet technique consists in downloadinga maximum of 128 different graphic configurations in normal character size in the RAM of the decoder : the visualization process then combines the elementary signs to display a high quality graphic design, according to codes which are subsequently sent by the source. True circles or exact curves may then be formed, with two distinct color areas per character. The principal advantage, even though some constraints on the design exist, is that a standard teletext decoder can display these graphics by simple additionof a RAM.

5.1.5 Handwritten teledesign on a TV screen is now a well known possible point-to-point communication medium using narrow band links. Addition of "chirographic display" in the broadcast process of an ANTIOPE decoder is also possible if this new "language", i.e. X.Y control of the electronic beam, is implemented in the decoder. As mentioned earlier, it should be more convenient to do animation this way than to impose time constraints on animated pages during the teletext cycle. Think of the use to which such a natural and inexpensive communication source could be put for educational purposes in developing countries.

6. ANTIOPE TELETEXT DELIVERY DEVELOPMENTS

In May, 1979, Sofratev formed a U.S. subsidiary in Washington, D.C., in order to follow U.S. network needs in the field of broadcast teletext, but also and primarily to market ANTIOPE-DIDON technology for business or specific audience use. This firm is ANTIOPE VIDEOTEX SYSTEMS, Inc. (AVS). The different marketing studies conducted in the U.S. last year all led to the same conclusion : the present potential market will not be a mass audience market before a few years' time, but a business market, and possibly a specific audience market. It is therefore essential to adapt our present technology to the real needs of business people or specific audiences, and also to define a large enough range of products to respond to each interest, at the lowest cost.

6.1 TRANSMISSION CHANNEL COST COMPARISON

We already mentioned that, in the U.S., MDS can transmit full channel teletext data during business hours or late night hours. An experimental transmission of ANTIOPE teletext data was successfully demonstrated last year, during the NICE III conference, on the Washington Microband MDS transmitter. This channel is especially well suited to business data delivery or pay teletext for specific audiences, and it is probably the least expensive one. Users are equipped with special antennas and SHF-UHF transposers; the complete set is now on the market for between 70 to 200 dollars.

TV cables offer a number of spare channels in many cases. The delivery cost is more difficult to estimate, but an evaluation based on the present average subscription price for CATV tends to prove that, due to the high data flow available, such a channel would be quite competitive with data packet transmission networks, probably by a ratio of 10 to 1.

In any case, competition in data communication fields could change these conditions in the future. Nevertheless, it seems that wide band broadcasting channels could compare very favorably with specialized point-to-point data transmission networks in the future.

Availability of VHF or UHF channels for this use is more difficult, due to saturation of this spectrum by present TV programs, and to the use of spare lines for mass audience teletext programs. Nevertheless, night or non-program hours could in most countries be used at very low cost per bit since a 4 Mbits/sec data flow is available. The ratio with normal data packet transmission networks could be 20 to 1, and the number of possible simultaneous users considerably increased.

6.2 TELETEXT DELIVERY MODES

Full use of such channels leads to completely different services from cyclic teletext. In a delivery mode, for instance, the client does not receive a permanent teletext page cycle. Instead, the multiple page memory decoder is able to record a set of pages, for instance 100 or more, which correspond

to those the user is interested in. Three different modes may be chosen according to the refreshing time relevant to the application or to the client's needs.

6.2.1 Passive Mode : Multiple page memory ANTIOPE-DIDON teletext decoders equipped with selective access controls can record specific teletext messages corresponding to the client's subscription. The access key, namely a magnetic card, serves as an identification for the desired information and for payment of the subscription fee. Transmission may be any time, preferably at night, but the ANTIOPE terminal is always passive, except when the client displays a page of the memorized data : in this case, access to any page is almost instantaneous.

6.2.2 Request Mode: The decoder will be connected via the normal switching network to the source of data through a telephone modem. An alphanumeric or numeric keypad enables the user to ask for a definite category of information or to specify the pages he would like to memorize. The terminal is then set to a waiting position : the data is automatically recorded when it arrives. The time required depends on how busy the network is, and can be indicated by the connection computer through the line : a "ready" signal goes on when the data is there.

6.2.3 Control Mode : The same telephone-connected decoder is used for the fastest possible delivery from the source : in this case the cost is much higher than in the previous mode, but this mode enables the user to obtain a whole bulk of data almost instantaneously and to go through it at zero access time.

In both the last two modes, payment is automatic through line connection to the source computer. The user's equipment for such teletext delivery modes is a standard ANTIOPE mixed Teletel-Teletext decoder fed through a so-called "Diode" device which regulates the access and manages the transactions.

A more highly computerized option will be available with mass memory and a second microprocessor for personalized processing of the recorded data.

7. INDUSTRIAL PRODUCTION SCHEDULE

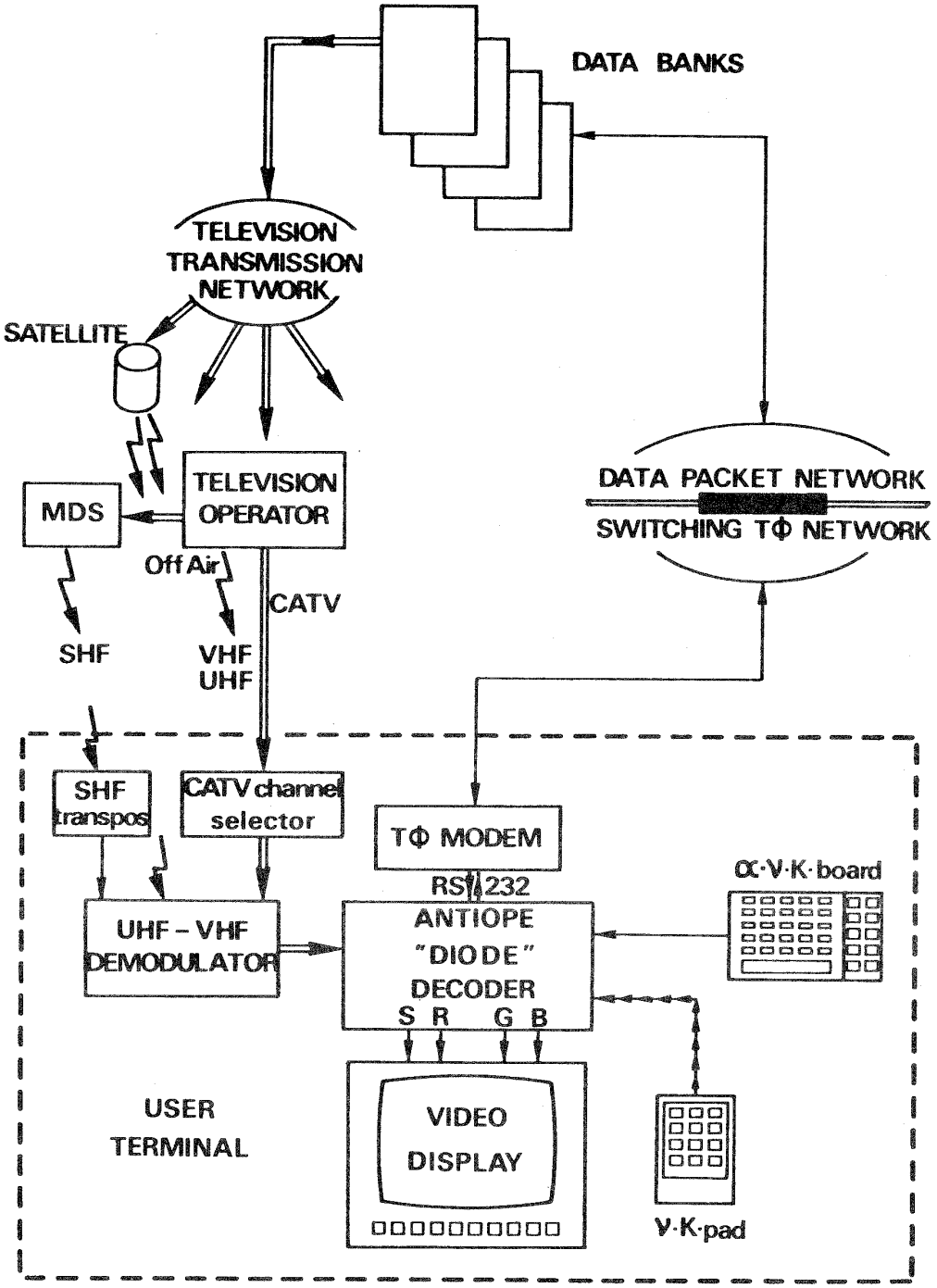
Apart from the U.S., many other countries are within the marketing target of Sofratev and of French technology. Up to now, no one has responded as immediately and aggressively as the U.S., but we are confident that others will as soon as the industrial production of low cost equipment promotes a better understanding of the system's exceptional flexibility. The first prototypes of completely integrated ANTIOPE decoders will be tested by mid-1980. The first small series of decoders for connection to TV monitors or to the peritelevision socket of the newFrench TV sets are expected late this year. At the same time, the first series of integrated ANTIOPE business terminals will be operational for field tests, with the Diode option.

Three integrated circuit manufacturers will provide VLSI circuits next year. The average target sales price for the basic ANTIOPE-DIDON decoder is approximately 400 francs within 3 years, for a production run of 500,000. The French teletext public service, associated with the large-scale telephone directory experiment and the Velizy Teletel tests should bring the audience to that size in less than 3 years.

8. CONCLUSION

ANTIOPE teletext has now been on the air for almost 3 years in France, and one year on the CBS network. A public service is operational on the four French television networks. ANTIOPE Teletel-Teletext compatible decoders are now available, and the best cost-effective data communication process can be tested for future organization of the videotex and teletext networks. A new concept of teletext message delivery for business or specific audience applications is now being worked out for tests in the United States in the near future. A completely compatible evolution of the DIDON concept is now leading to further improvements of the ANTIOPE broadcast display performances in relation to high quality graphics and display animation, both highly desirable features for educational purposes, for instance.

VLSI circuits will be available in France next summer, and will be manufactured for business terminal and decoder board mass market production at the beginning of 1981.



MULTIPLE ACCESS "DIODE" DECODER FOR INTERACTIVE MESSAGE DELIVERY

PLANS AND PROJECTION FOR THE ELECTRONIC DIRECTORY SERVICE

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The electronic directory project will give rise, in 1982, to a full-scale experiment of the service in ILLE-et-VILAINE with 270,000 subscribers.

To make fast development possible, so as to provide the service to all subscribers within ten years, a complete and extensible system is studied. This system includes Videotex terminals supplied with an alphanumeric keyboard, an access network and a two level informatic system : the inquiry centre and the documentation centre.

I - ORIGINS OF ELECTRONIC DIRECTORY PROJECT

The operation of the telephone information system at the present time gives rise to two concerns :

- manual information centres are saturated in spite of the 3 000 viewers used by operators. In 1985, at least twice as many employees would be required,

- the costs of the paper directory, which are increasing more or less with the square of the number of subscribers, are no longer offset by advertising income. Finally, the rapid obsolescence of the paper directory (at the time of updating, 40 % of inscriptions are new or have been modified) contributes to increasing information and complaint traffic.

Any economies in the paper directory by extending the duration of issue or by decreasing the area covered, will therefore result in an overcost of information. Consequently, in order to increase operator efficiency, the S3 project was launched in 1978 so as to replace the consultation of microfiches by the inquiry of a data base by means of display consoles. This system, which should improve service quality by file updating on a daily basis, improves operator efficiency by about 20%.

However, excessive task division and the utilization, 8 hours a day, of CRT screens could produce problems from the viewpoint of operator working conditions. Consequently, it has been decided to provide users with the capability of consulting the data base directly by supplying them with Videotex terminals.

This solution, which will allow access to directories of all the Departements, also affords a permanent 24-hour information service. Finally, economic calculations reveal that a saving will be achieved after a few years in relation to the present system.

2 - USER SURVEYS

The acceptance by users to have the paper directory replaced by a Videotex terminal is a major difficulty. Qualitative surveys reveal four types of attitude.

a) Refusal

This is the reaction of people who have practically no telephone information requirements. This refusal stems from a generalized refusal of anything electronic which is considered expensive, and from the fear that the household will be invaded not only by the terminal but also by the information it provides.

b) Agreement

This reaction is expressed by professionals who are dissatisfied with the present situation and for whom electronic applications represent a natural solution. Nevertheless, these same people consider that private requirements are small and that the terminal is more suited for a secretarial utilization.

c) Deviation

In the private sector, the electronic directory is accepted for other reasons than its primary function. Similarly, technical progress is accepted. The system would increase the security factor by facilitating emergency department calls and would be a prestige factor as well.

d) Reconstruction

Obviously, the service will be broadened. From the professional standpoint, information search is enhanced, and a reservation service will be available. From the private standpoint, practical information could be accessed as well as emergency departments, seat reservations, and so forth.

In all cases, the requirement is for the terminal to be small and for the service to offer fast access and easy use.

3 - THE SERVICE SCHEDULED IN THE ILLE ET VILAINE DEPARTEMENT

In order to adapt the service to user requirements, the decision was made to carry out a full-scale experiment in the Ille-et -Vilaine Departement of France.

The service will be opened at the end of 1981 and the 270,000 subscribers of the Departement will all be equipped with a directory terminal by the end of 1982. In the meantime, experiments are being conducted with a hundred or so terminals for the development of a user-service dialogue and the inscription file update circuits.

The scheduled service will have the following characteristics.

3.1 - Types of search

As with the paper directory which is divided into white and yellow pages, a distinction will be made in the electronic directory between alphabetic search and professional search.

Alphabetic search consists in finding the telephone number of a subscriber who is known and well identified by his name and address. If the exact address is unknown, the christian name and the profession can be given. It is scheduled to extend this pin-point search by a scanning search where the pages of subscriber inscriptions living in the same road, for example, will be turned.

Professional search consists in finding a list of subscribers meeting commercial criteria. In order to replace advertising copy inset in the yellow pages of the paper directory, three access types are designed :

- primary and secondary activity,
- specialities sold,
- trademarks represented.

These criteria, apart from the main activity, will be input on the files subsequent to sales made by the Office d'Annonces which is the sole advertising concessionnaire for telephone directories.

For each inscription selected, the user can request the cost for a one-minute communication with his correspondent. To answer this question, the system automatically identifies the directory terminal of the caller.

3.2 - Aids to users

Users should not be faced with an information language which is too rigid ; hence the following arrangements have been scheduled.

a) A list type dialogue provided at high speed and the possibility of making corrections in the case of search failure will be offered to users. An aid-key of the alphanumeric keyboard of the terminal will make it possible to request information by filling in the inquiry form for each item.

b) A district file will, for addresses, allow placenames to be connected to the districts where inscriptions are issued. Similarly, for searches by profession, a file of access keys to all professions (activities, specialities, trademarks) will make it possible to handle synonyms (e.g. cars and automobiles) or else to request the user to specify a subject which is too vague (e.g. transport).

c) A certain number of spelling mistakes, such as OO instead of OU, could be taken over by a phonetic search of the inscription.

d) Upon consultation of the reply, it will be possible to flip through the answer screens both forwards and backwards and in the event of dissatisfaction to come back to the question asked in order to modify it. Three function keys of the terminal are dedicated to this purpose.

e) To limit the number of inscriptions of professionals answering the same criteria, the search is carried out in a delimited geographical area defined by the user. Conversely, if the search is a failure (alphabetic or professional) it is possible to extend the search to neighbouring areas of the district designated.

f) Finally, in the case of an unexplained failure, one of the terminal keys will allow the user to call up the assistance operator. This operator receives the complaint on his screen. After access to the text of the question asked, he can either offer a correction, or call the user back by telephone.

4 - INFORMATION CONNECTED WITH INSCRIPTIONS

To break the monotony and to meet the desire for service extension, it is scheduled to transpose, particularly for the search of professionals, the advertisements from the paper directory. The Office d'Annonces will hence be in a position to offer its customers :

- enhanced inscriptions in the form of enlargements, background inversions, and addition of a motivational text (to a maximum of 3 rows),

- the possibility of accessing - at user request - a core of information connected with the selected inscription. This core is made up of Videotex-format pages organized to be scanned as a function of the information sought. An example of an information core is the in-house directory of a company broken down by department.

5 - STRUCTURE OF THE SYSTEM

Replacement of the paper directory in the Ille-et-Vilaine Département involves equipping all subscribers with directory terminals and providing them with access to the subscriber file of the Département. The extension of the service, to give information on the other Départements to Ille-et-Vilaine users on the one hand, and to other subscribers of the country on the other, requires the system to be of a modular structure. This structure must make fast development possible so as not to interfere with the production rate (+) and allow the target price of 400 French francs (exclusive of tax) per terminal to be attained. A development assumption is given in Table.1

Figure 1 shows the structure. It includes an inquiry chain and a file update chain.

5.1 - Inquiry chain

The inquiry chain is designed on four levels:

(+) A pre-series order for one thousand terminals for delivery in mid-1981 has already been placed with each of the four manufacturers selected : Matra, STE/LMT (Thomson), Telic (C.G.E. Group) and T.R.T. Radiotechnique

a) The directory terminal, which comprises :

- an alphanumeric keyboard with the function keys necessary for composing the question (cursor management and validation of the question) for consulting the answer, and for asking assistance.

- a black and white screen with its display logic.

- a Videotex character decoder.

- a 1200/75 bit/sec modem.

Apart from the colours which are replaced by a level of grey, the terminal uses the French videotex specifications for display and communication. So the Directory terminal is built with the same chips as those of Teletel terminals, and is capable of accessing to the host databases connected to Teletel.

Until 1983, the terminal will be separate from the telephone set. It has a phone plug to connect it to the telephone set and a jack to be plugged into the telephone outlet in any room of the house.

The terminal makes access through the telephone network to a terminal concentrator.

b) The directory terminal concentrator (DTC)

Its role is a multiple one. It ensures interface between the telephone network and the data transmission links for service access. It ensures certain functions for screen display such as echo return, and transmission in block mode towards the service. Subsequently, its role could be broadened to perform switching as a function of telephone numbering received and to elaborate the taxation.

One concentrator serves the subscribers of a local or urban network (> 20,000)

c) Inquiry centre (IC)

This centre manages the dialogue with users. For this purpose, the IC carries the dialogue assistance files (district files and file of access keys to all professions). The search will only be switched to the corresponding documentation centre if it has been formulated correctly.

In the opposite direction, the CI ensures the Videotex formatting of information supplied by the interrogated documentation centre and presents it to the directory terminal in the form of pages.

The IC also serves the terminals of assistance operators, and hence it stores user-service dialogues in memory so that it can present them to the operators if required. Finally, it carries out statistical calculations necessary for system operation.

The IC accesses a nearby documentation centre by means of dedicated links and by the TRANSPAC network for other more distant documentation centres.

One IC covers an area of 200,000 to 500,000 subscribers.

d) Documentation centre

The documentation centre carries the subscriber inscriptions and the information connected with them (inscription enhancement and information core). The complete file is divided between the DC which covers an area of about 3,000,000 subscribers. For security reasons, the same inscription is present on two DC.

The DC ensures file consultation as a function of the requests transmitted by the IC. It also carries out the reorganization of files which have undergone several updates.

The DC will have the capability of being common to the manual information system (S3) and to the electronic directory.

5.2 - Update chain

Updates come from two sources :

a) The Agences Commerciales des Telecommunications (ACTEL) which receive requests for subscription, transfer or cancellation. These requests are managed by the data processing application "management of requests" (GDEM) and "official inscription" movements after validation by application 14B (national subscriber file) are supplied to the electronic directory system.

b) The Office d'Annonces (O d'A) which sells additional professional inscriptions comprising the access criteria and the information connected with inscriptions (see § 4).

All the movements corresponding to these two sources pass through one or several Management Centres (MC) associated with the electronic directory system and S3. The role of the MC is :

- to perform "coherence checks" between the movements coming from the O d'A and the official inscriptions,

- to seek pointer words in the inscriptions so as to sort them into one or several places and to improve the chances of inquiry success (case of acronyms),

- to classify the inscriptions and to direct them toward the DC serving their area,

- finally, to put the inscriptions into the "system format".

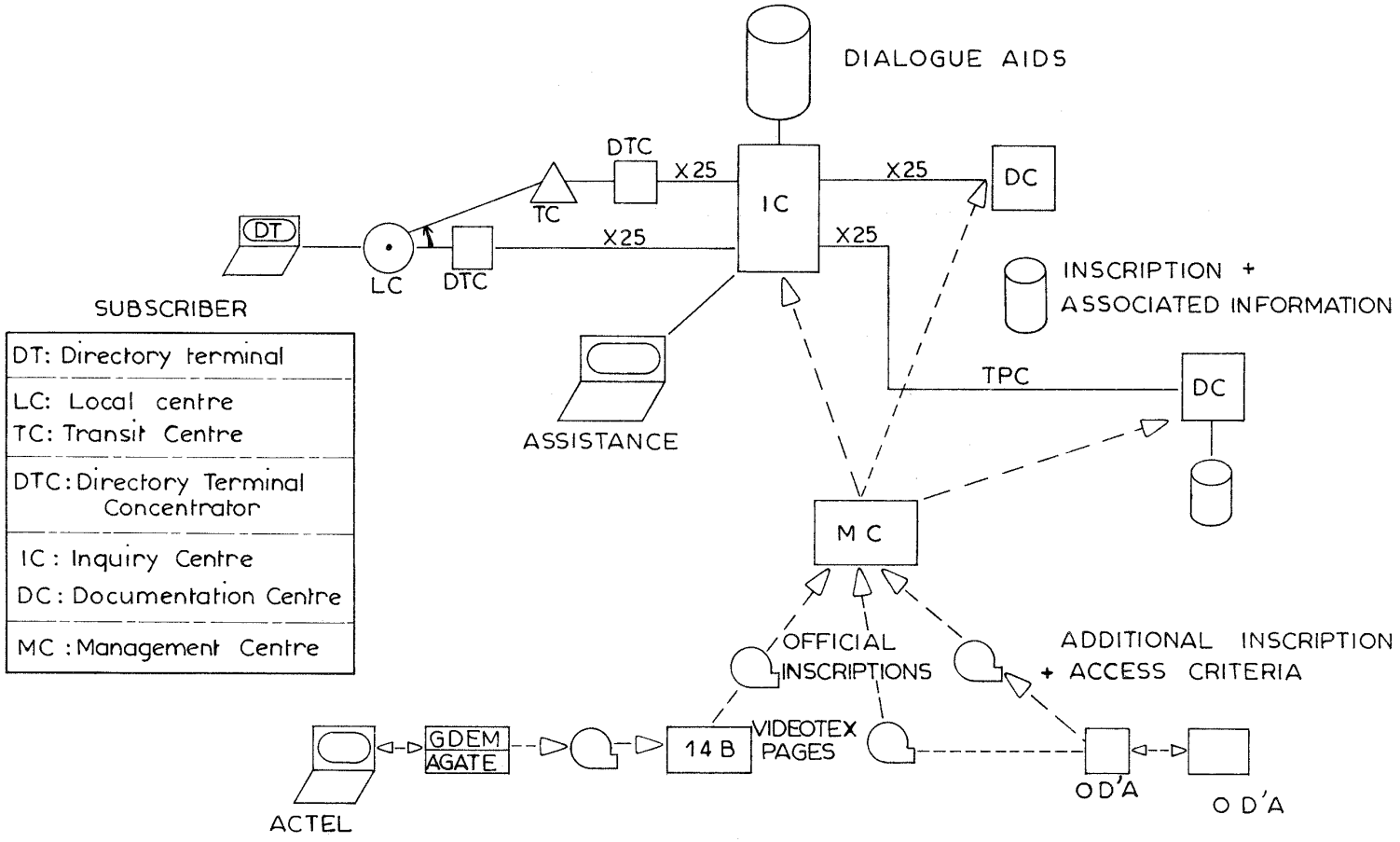

Fig : 1 ORGANISATION OF ELECTRONIC DIRECTORY SERVICE

YEAR	80	81	82	83	84	85	86	87	88	89	90	91	92	93
NUMBER OF MAIN LINES (IN 10^6)	16,0	17,9	19,8	21,6	23,3	25,0	26,4	27,9	29,2	30,5	31,8	32,5	33,3	34
NUMBER OF TERMINALS (IN 10^6)		0,02	0,27	0,8	2	4	6,6	10	14	18	22	26	30	34

TABLE 1 : HYPOTHESIS FOR THE EXTENSION OF THE ELECTRONIC DIRECTORY SERVICE

Prestel Operational Strategy

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Summary

This paper describes the network used to provide Prestel as a local call service and explains how this network will be expanded to extend service to the majority of the United Kingdom. The management of this network and Prestel as a service will also be discussed together with the establishment of complimentary services and support products.

1.0 Introduction

Prestel Public Service began in March 1979 with an embryonic service offered to residential customers from a single computer sited in Central London. The computer served the dual role of information retrieval and online updating, and provided an editing service to Information Providers. In September 1979 the single computer was replaced by a Prestel network consisting of a dedicated, semi-secured Update Centre (UDC), and two satellite information retrieval computers (IRC). This marked the start of a full Prestel Public Service in the London local telephone call area, and established a pattern for the extension of Prestel, as a local call service, to other parts of the United Kingdom.

2.0 The Prestel Network

The computer hardware is totally conventional and taken from the GEC 4082 range. The UDC is partially secured with a standby central processor unit, store and disc drives, but requires manual intervention to change from the working to the standby equipment. Operational staff are available at all times and the centre and its' staffing have been designed to achieve a very high availability. The centre can only be used by Information Providers who have dial-up access to 1200/75 bit/sec ports, and a small number of 300/300 bit and 1200/1200 bit/sec ports. Information Providers(IPs) are able to edit on the system or **input bulk** data from intelligent terminals or other computers.

The Update Centre networks data by dedicated circuits and 4800 bit/sec modems to the satellite retrieval computers. Two circuits are used to provide security and increase the speed of updating. IRCs are located in local telephone call catchment areas. They are unmanned but have trained staff available on a call-out basis. To provide a secure Prestel service, each local call catchment area has access to at least two IRCs or groups of dataplexed ports. Customers' Prestel terminals are programmed to be able to access both computers or groups of ports so that failure of any one computer will not cause a total breakdown of Prestel service. Failure of one computer during the busiest period would cause severe congestion, but the busy periods are generally of very short duration and in large local call areas, such as London, the extra traffic would be spread between a number of different retrieval computers and would have a negligible effect on the quality of service.

2.1 Network Expansion

The first generation of UDCs has been designed to support some 60 ports for data editing and entry, and to be able to network updated information to at least 12 satellite retrieval computers. The first generation of retrieval computer is designed to support up to 200 interactive data access ports, and will probably be evolved, by the use of front end processors, to support several hundred additional ports when growth requires the capacity to be extended.

To support a programme of rapid expansion of the Prestel local call area throughout the United Kingdom requires three UDCs. Figure 1 is a simplified diagram of this arrangement. IPs, the database and retrieval computers have been divided between the Update Centres designated A, B and C. The Update Centres are, of course, interconnected and this ensures that data only needs to be entered once to effect rapid updating throughout the network.

A network based on two Update Centres is planned to be operational by mid-1980 and the installed capacity will exist for the three Update Centre configuration in early 1981.

2.2 Geographic and Population Coverage

Sufficient computers are being installed during 1980 to extend Prestel local call service to the areas shown in black on Figure 2. Generally computers will be installed in the large population centres and groups of ports will be dataplexed to provide local call access in the smaller centres. The programme up to March 1981 will provide Prestel local call access to greater than 60% of the telephone population.

Sufficient long term planning ie., enlargement of the Telecomms network and acquisition of computer sites, will be completed to extend Prestel as a local call service to the shaded areas shown in Figure 2. The programme is planned up to 1986 and will be implemented if sufficient demand exists for Prestel as a local call service. Figure 3 is a demographic map that shows the population distribution that will have access to Prestel if the 1986 programme is achieved. In percentage terms, it is in excess of 95% of the telephone population.

3.0 Management of the Prestel Network and Service

To manage the Prestel service within Telecomms Regions, a small dedicated staff have been established in a separate Regional Prestel Centre (RPC), Figure 4. The Regional Prestel Managers' staff deal with customers sales and service enquiries and register new Prestel customers on the local IRCs. The latter task is completed by Telephone Operators and, if the demand exists, arrangements have been made to extend this service into the evenings and weekends.

The RPM is also responsible for liaison with local TV retailers, rental organisations and manufacturers representatives. Close co-operation is necessary to ensure that the area of service, access codes, registration and other procedures are clearly understood. The prime methods used to disseminate information are newsletters and a special TV dealers database that has been established on Prestel and can be accessed via the Prestel gazette. We are also in the process of establishing a registered showroom scheme that will give Prestel showroom and main showroom status to organisations that satisfy a set of basic assessment criteria. The prime requirement is the Showrooms' ability to provide a competent demonstration to potential customers. Finally, to ensure that the provision of jack sockets by the Post Office does not delay the delivery of Prestel sets by the TV industry, we have introduced a special procedure that should ensure that jacks are provided within 5 working days of the customer applying to the Post Office for Prestel service. In the majority case we can expect jack sockets to be installed within 48 hours.

3.1 Network Organisation and Maintenance

Figure 5 is a diagramatic representation of the Prestel network and the associated management communications necessary to administer and control all aspects of the Prestel service throughout the U.K. The circuits designated S3V link a microprocessor based monitoring equipment termed Vampire from each computer site. to the local RPC and the National Prestel Operations Centre (NPOC). This equipment provides a remote display of the status of each computer port and enables the remote management sites to determine the instantaneous traffic loading and to be informed immediately of short or long term service or maintenance difficulties. During the working day, the local RPCs are responsible for the performance of the retrieval centres. Outside normal working hours, the NPOC performs this role and is also responsible at all times for the performance of the UDCs.

3.1 continued.

Although a Freefone number is available at the RPC for sales enquiries, we expect the normal Prestel customer to follow established custom and practice and apply for Prestel service to the local telephone area. Arrangements have been made to receive these enquiries, install the Prestel jack and pass on the customer details to the RPC in preparation for terminal registration. Similarly, although a Freefone number exists for fault reporting directly to the RPC, experience to date suggests that the vast majority of faults occur in the Prestel TV set, and should, therefore, be reported to the TV retailer or rental company. Normal telephone faults should be reported to 151 or the locally advertised fault reporting number, leaving a small residue of repeat or very difficult faults for the RPC. To solve this type of fault, the RPC has recourse to a small force of specially trained "trouble shooters", who can undertake the necessary detailed investigations.

4.0 Complementary Services and Products

The current database installed at IRCs will support 250,000 pages. A decision has been taken to extend this to 500,000 pages and this should be completed in two stages, an additional 125,000 pages by the end of 1980, and a further 125,000 pages by the end of 1981. If the demand exists, it is possible that an element of this extended database will be available for local information related to particular IRC catchment areas.

In the last half of 1980, we expect to open a stand-alone computer in London that will provide retrieval together with local editing and update facilities. This computer will not contain the Prestel Public Service database, but will be used exclusively for closed user group information. Local and STD telephone access will be available to this centre.

Other specialist, stand-alone, viewdata computer centres may be provided if there is a demand and they appear to be commercially viable.

4.1 The Evolution of Support Products

Conventional Prestel terminals are being produced by a number of television and telecomms manufacturers. However, penetration of certain market segments would be assisted by the development of a range of more specialised Prestel support products. The potential product that has received most publicity is the very low cost adaptor that would convert a conventional TV set into a Prestel set. This adaptor bears comparison with the TV game and several games manufacturers are working on, or considering, producing low cost very basic Prestel adaptors which either operate in a stand-alone mode or can be added to a sophisticated modular TV game. The basic problem is that most of the specialist Prestel semi-conductors and sub-assemblies, such as the modem, have only been in production for a short time and require a further period of evolution before very low production costs can be achieved. Progress is, however, reasonably encouraging and it is probably that low cost products will be available in two to three years.

A further useful product would be an intelligent adaptor containing a microprocessor and a range of optional peripherals eg., keyboard, floppy disc etc. This would convert a standard Prestel TV set into a very flexible intelligent, programmable Prestel terminal. Such an adaptor could be used for programmed learning, tele-software, local storage of sections of the database etc. A basic intelligent adaptor of this type could be manufactured relatively quickly and cheaply from currently available off-the-shelf components and sub-assemblies. We are talking to a number of parties who could have an interest in producing such a device and, in the future, expect to be able to investigate particular market sectors. The converse approach to an intelligent adaptor is also possible ie., encouraging existing manufacturers of intelligent terminals and home computers to produce a Prestel option.

Finally, there is an urgent need to develop a range of microprocessor systems that can assist the use of Prestel in large organisations, hotels etc. A simple application would be for a microprocessor that could be used by a hotel receptionist to determine a customers' Prestel bill. More advanced microprocessor devices could support a number of terminals either via the Telecommunications PABX or in a stand-alone mode, and provide a small local database together with full or controlled access to a remote Prestel computer.

5.0 Conclusion

The Prestel service has been successfully added to the range of existing services provided by Post Office Telecommunications. By the end of 1980 over 60% of the telephone population should be within the Prestel local call catchment area and sufficient planning will have been completed to extend this to over 95% by 1986, provided there is sufficient demand. A management organisation has been established throughout the U.K. to co-ordinate the maintenance, customer service, marketing and other liaison activities that are an essential part of Prestel. These management centres can be expanded to cope with growth.

As technology improves and the penetration of the Prestel service increases, a range of support products should appear in the market place that will allow Prestel to penetrate larger as well as more specific market segments.

EXPANDED NETWORK -3-MACHINE UDC

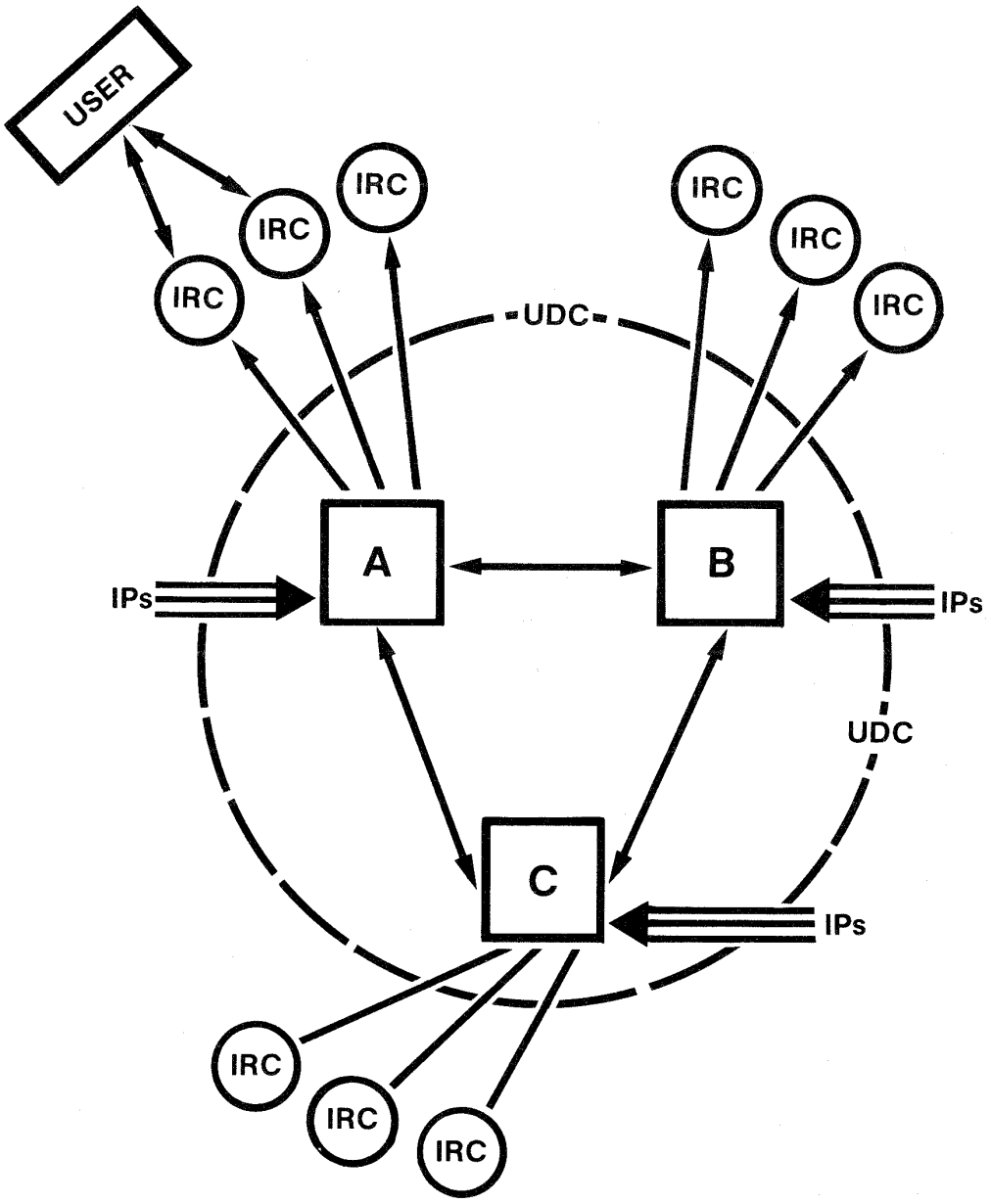
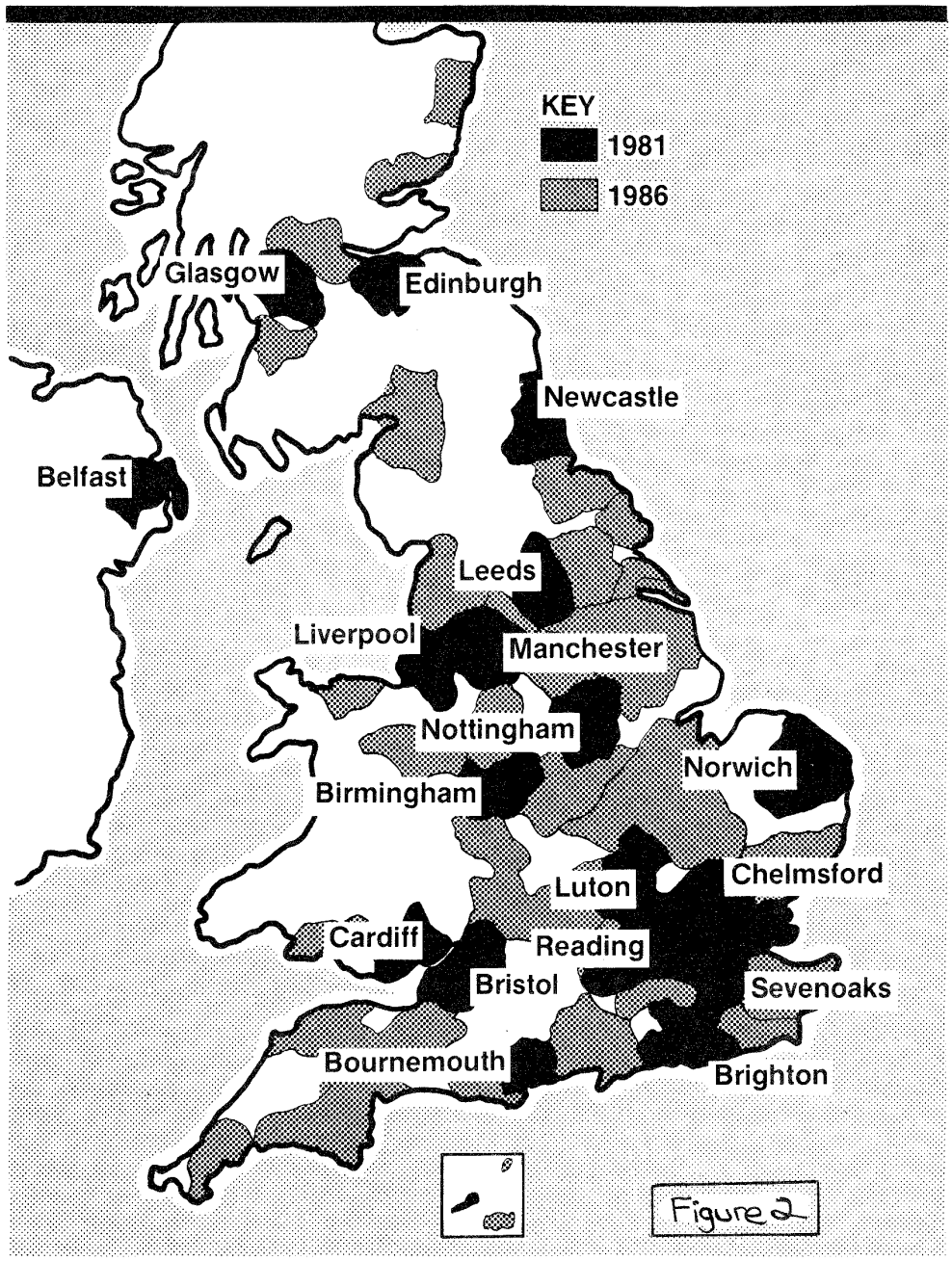


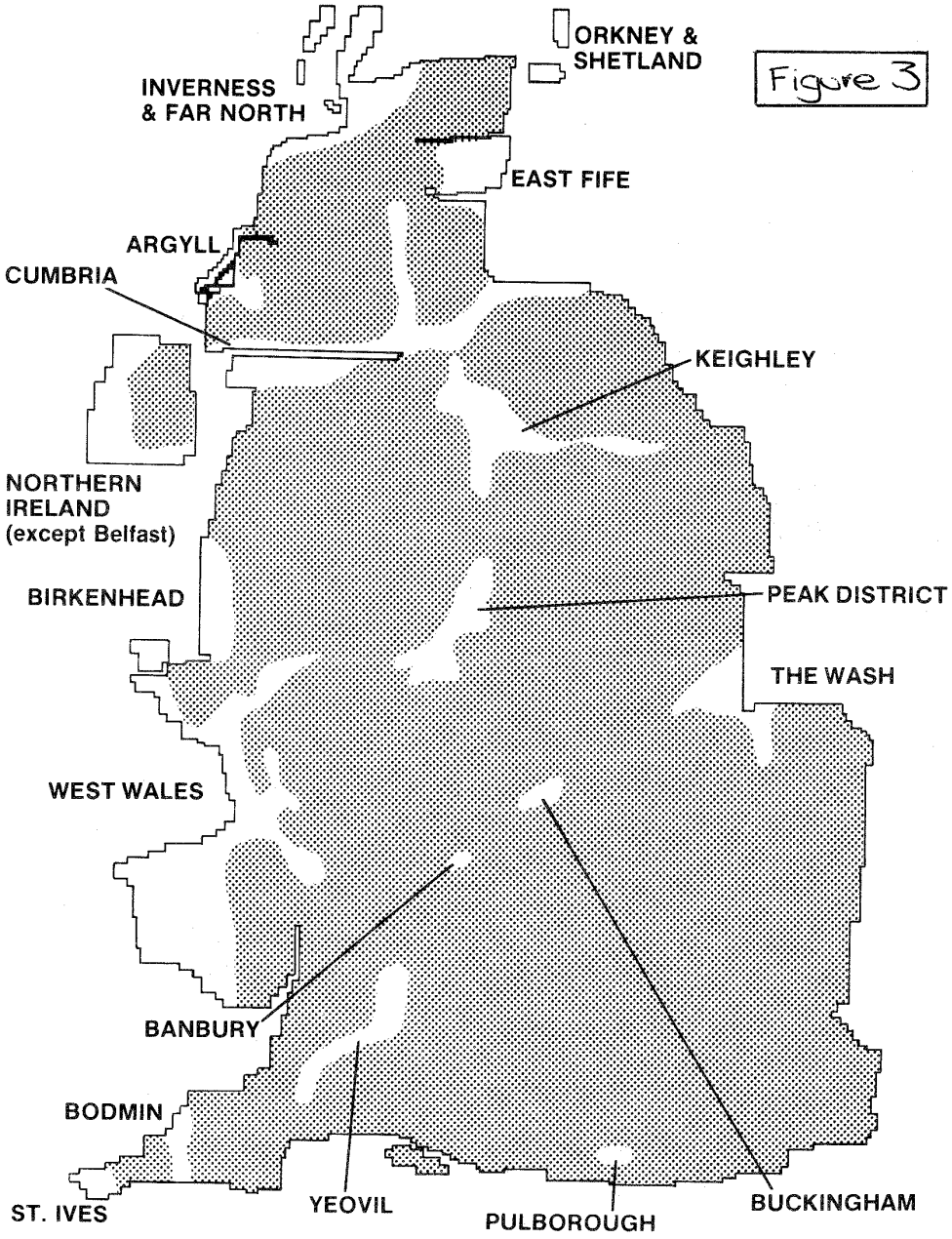
Figure 1

Map of coverage provided by Computer Centres

at 1981 & 1986



PRESTEL: AREA COVERED BY 1986
(DEMOGRAPHIC MAP)



STRUCTURE OF TYPICAL REGIONAL PRESTEL CENTRE (RPC)

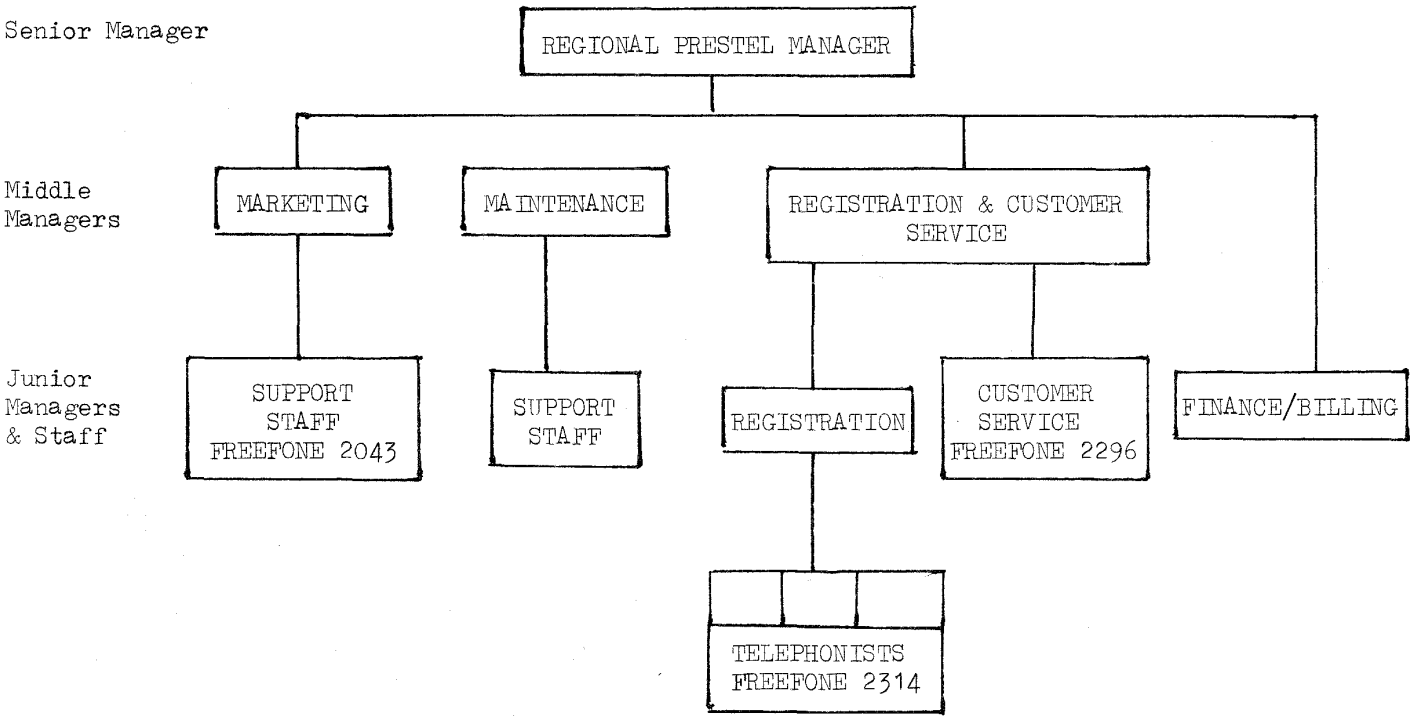


Figure 4

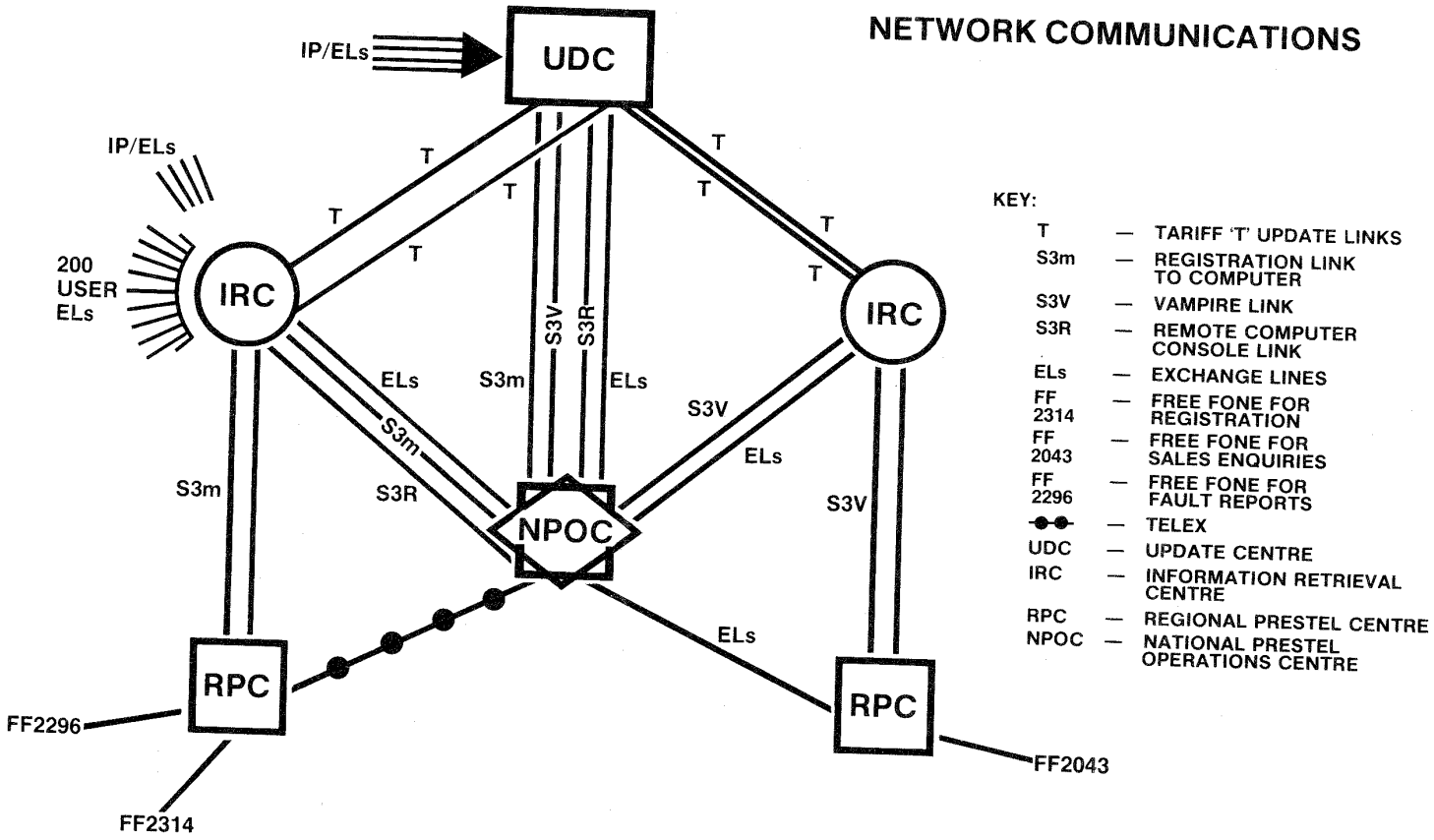


Figure 5

The Electronic Newspaper

P. McC. Montague
Technical Development Director

The Birmingham Post & Mail Ltd.

England

Viewtel 202 is described by The Birmingham Post & Mail Ltd. as the 'first electronic newspaper'. It operates through the British Post Office's Prestel service to provide a complete package of national and regional information, including news and advertising. It aims to provide the user with a comprehensive information bank at the minimum possible cost and for the advertiser, a well used means of getting in touch with the user.

Viewtel 202 is the viewdata service of The Birmingham Post & Mail Ltd., operating through the British Post Office's Prestel Service.

Our introduction of the concept of an electronic newspaper onto Prestel stems from the earliest involvement of The Birmingham Post & Mail Ltd. in the original viewdata pilot trial, organised by the British Post Office in late 1975. Our approach has not changed in principle since then, although it has in detail.

To demonstrate and explain our view of how we will move forward in videotex it is important to understand our origins as publishers, and also to examine our experience to date in Prestel. Our path forward is largely governed by our experience in traditional newspaper publishing and, more recently, in electronic publishing. This is combined with, we hope, a creative awareness of the extensive new opportunities that videotex offers to us.

The Birmingham Post & Mail Ltd. operates the largest daily newspaper publishing centre outside the National press in England. The newspapers published are:-

Newspaper Title	ABC Circulation
	July - Dec. 1979
The Birmingham Evening Mail Series inc. Sandwell Evening Mail and Sports Argus	341,333
The Birmingham Post	42,277
The Sunday Mercury	195,815

The Evening Mail Series has the largest ABC six day evening paper circulation in the United Kingdom, and is third only to London's 'Evening News' and 'Evening Standard' on a Monday to Friday basis.

The Birmingham Post is an up-market morning paper with a circulation of 42,277. It sells more copies within Birmingham than 'The Times'; 'The Guardian'; 'The Financial Times'; or 'The Telegraph'.

The Sunday Mercury is the largest regional Sunday newspaper with a circulation of 195,815. It outsells virtually all of the 8 National newspapers available within Birmingham.

Why, then, with these significant and prospering publishing

interests in newspapers and commercial radio is The Birmingham Post & Mail Ltd. investing substantially in videotex? And, in particular, in Prestel? Why should it use as its vehicle the concept of 'the first electronic newspaper' and what does that mean?

Until mid 1978 we kept our investment at a low level, with more management time invested than cash. We already knew by then that the scale of the Post Office proposals, combined with the lack of confidence by the set manufacturers in the intended rate of progress, meant that a genuine national public service, with large volume set availability, would be well behind the original targets in time scales. Further, that the whole cost structure of the Prestel project was actively against it becoming a low cost media for Information Providers. Their charges had escalated 4/5 fold. Total user costs had escalated rapidly too. In our view they were already prohibitive for a rapid development of the medium in the mass market. It was, and is, in danger of becoming business orientated, with no cohesive development of the data in the system to enable an attractive package to be easily and cheaply available to the whole mass of potential users.

This pattern of a relatively high cost business orientated medium eased many of our concerns about Prestel's immediate impact upon newspapers, but caused us major concern on the development of the medium as such.

The specialisation of particular I.P.'s; umbrella arrangements with indiscriminate groupings of sub I.P.'s and the development of endless expensive entertainment gimmicks in the form of quizzes and games has led to a commercially dangerous development pattern in Prestel - it is not only expensive but it is also difficult to use for those wanting to access a broad package of needs and entertainments.

This pattern of developments encouraged us, in October 1978, to launch our own trial package for the Motor Show 1978 at the National Exhibition Centre (N.E.C.). It took the form of the 'first electronic newspaper'. It set out, in a rough and ready way, to provide a broad based package of useful and, hopefully, necessary information for people in Birmingham attending the Motor Show. The emphasis was upon minimum cost, and with maximum simplicity. This was to be our first public feed back of market place information. With the help of British Relay and Radio Rentals, two sets were placed on Exhibition Stands with controlled usage. A further five sets were positioned at public access points in hotels. All the sets were available for use for ten days. The accesses to the five publicly available sets were a revelation - nearly 70,000 accesses in total, or nearly 1,000 accesses per set per day.

No-one attended the sets to give advice or instruction - they were simply tuned to Viewtel 202 with no information on how to access other I.P.'s databases. No charges at all were made to the users (or the hotels). Unfortunately, there were no individual frame access figures available at that time, so we could only assume that our frames, as a package, were of interest to hotel visitors.

The topics covered were:-

National News	10 stories updated 12 hours a day
International News	10 stories updated 12 hours a day
Motor Show News	10 stories updated 12 hours a day
Business News	10 stories updated 12 hours a day
Financial News	10 stories updated 12 hours a day
Sport	As appropriate with 10 stories max.
Horoscopes	
Lucas Industries	Company Profile
Lucas Industries	Programme of events for Motor Show
What's On	Covering hotels, restaurants, night clubs, theatres, cinemas, sports fixtures and facilities, sauna and solaria etc.
Train Timetables	Cross references from and to Viewtel 202

The basic but fundamental conclusion drawn was that a simply structured information bank, with zero cost had a high degree of public acceptability.

This experience encouraged us to initiate a small scale regular news service, with one full time journalist and occasional extra support. Inputting was handled by aptitude tested compositors (N.G.A. members). Marketing was put in the hands of a senior member of the Advertisement Department, who was allocated full time to Viewtel. The first electronic newspaper was launched.

What has happened then since this initial launch?

From this initial low key approach we have now arrived at the specific objectives of creating a cohesive controlled information bank providing a National Information Service with a regional slant whenever relevant. This will be aimed at both the business and the mass residential users, wherever possible. Games and quizzes are, and will continue to be, included - over 30% of all accesses to Prestel at this time are in the entertainments categories so it would be foolish to ignore them, but they will not dominate our information bank. Our target market is as wide as the purchasers of sets and

and probably wider than any other pure I.P. (i.e. one who does not encourage sub I.P.'s other than in relevant topics). We are also almost certainly less inhibited in the range of material we are willing to include to attract a wide base of users. Thus, the key areas that we see as growing on Viewtel 202 are:-

1. Mass Market Applications

These will have broad based market appeal, based upon relevant information, with good data base control so that users can locate a wide range of relevant information simply and quickly. Apart from 'home entertainments', it is not intended to levy an I.P. frame charge for such information. Both business and residential appeal can be achieved if appropriate information is selected. This will be particularly appropriate to encourage the business justified residential videotex T.V. set.

However, the majority of the mass market users will be more likely to be paying their own telephone charges, computer access charges, and I.P. frame charges. Taking a broad spectrum of the information on Prestel it is quite possible for frame charges to be twice the combined amount of call charges and computer access charges, outside 9 a.m. - 6 p.m. Monday to Friday. Total 'information' costs for 10 minutes per day, 7 days per week usage of Prestel can easily be:-

(i)	Call rates 3p x 7 days	£0.21 per week
(ii)	Computer Access Charges 12p x 7 days	£0.84 per week
(iii)	I.P. Frame Charges, say 24p x 7 days	£1.68 per week
		£2.73 per week + V.A.T.
Total Information Retrieval Charges		£141 .96 + V.A.T. per annum

The first two of these charges would be 3/4 times higher during business hours.

Increase in T.V. rental charges @ £12 x 12 months	£144.00 + V.A.T. per annum

Thus, for the non-business justified videotex set, the increase to household budget costs could be £285 p.a. (+ V.A.T.). This is excessive and will inhibit growth in this area of the market unless:-

(a) Computer access charges are drastically reduced in 'off peak'

hours.

(b) I.P. frame charges also reduce drastically at all times to residential users.

(c) Rental charges for videotex T. V. sets reduce in real terms.

To encourage the growth of sets, and usage of Viewtel 202, there will be no frame charges for our National and Regional information service. Home Entertainments are intended to be self financing. Advertisers and sponsors will provide all other revenue. If users come to use our service exclusively, or ours plus other non charging I.P.'s, then they could save some £90 per annum.

Regardless of whether charges for the private householder are reduced or not, we are confident that we can provide a wide base of information which will appeal to the remaining 'business' orientated sector.

2. Home Entertainments

This will, in time, be operated as a profit centre, with a low I.P. charge. This sector is free at present, but in time when there is substantial growth in sets a low charge of say 0.2p or 0.3p will be levied.

3. Internationally Relevant Information

This would be a developing position, with increasing information over a period of time. Already we do have up all National Exhibition Centre show and show organiser details. Travel, holidays, business and financial information and certain types of news information are all probable areas of development.

4. Specialist (Business) Applications

This is a new area so far as we are concerned, but it has already become very clear that this will be an area of major growth over the next 5-10 years. We intend to be fully involved, within the availability of Prestel Frames. The frame shortage is the main inhibiting factor at this time, plus the problem of trying to develop on all fronts simultaneously.

To move towards the achievement of development in all these areas Viewtel now employs three full time journalists, 2 full time marketing/sales and support staff, plus the equivalent of 5 keyboarding staff. There is also a substantial amount of senior (Board) level time spent on guiding and directing Viewtel. The Editor's target is to achieve 300 news story updates per day, mostly of one frame, but occasionally more. One frame stories

involve 60-70 words. I wonder how many newspapers have a 'news count' anything like 300 live stories per day?

The unique facility of Prestel of being able to interrogate the computer on the number of accesses to any page has already been invaluable in assessing the response to different material put onto our Information Service. This facility has shown quite clearly that a higher news count gives greater usage of Viewtel.

The news can be instant, and, with effort, compete with any service put forward by teletext, except that their services are totally free of charge. Instant news is ideal for the medium, as well as directory or reference information. However, in depth, high word count material is not - hence high quality editorial precis skills are needed, with the newspaper adapting to re-emphasise its detailed in depth coverage of events. At this stage we provide purely factual news coverage and do not offer any comment. This, again, is based upon our objectives of as broad an appeal as possible.

Our mass information service on advertising will be broken down into four main categories, equivalent in newspaper terms to:-

Directory Advertising
Display Advertising
Classified Advertising
and Sponsorship

These, again, will be broken down into national and regional sectors. Advertisement features/profiles and page sponsorship will also be developed, and cross-references to, and from, other relevant data bases.

Directory Advertising will cover, for example:-

What's On or Entertainments
Car Dealers
Estate Agents

and, in time, all business 'reference' and Yellow pages type advertising. These provide simple reference information about suppliers and services in particular sectors, and usually take up half a videotex frame per Company. From these half frames cross references follow to more detailed information on complete frames or information trees. This type of development could show a substantial growth area for newspapers. The necessary price of advertising in this media is so low in directory type information - say £20 per half frame with no updates per year that many new advertisers would be attracted to it. The equivalent

space for one day per week for a full year in the Birmingham Evening Mail would cost at least £350 as compared to £20 on our videotex service at present. As a result less than 30 of the 700 restaurants in the Birmingham area advertise regularly in the Evening Mail. Nationally, directory type advertising shows substantial opportunities for example, in dealerships and listings of retail outlets and suppliers for particular goods.

Display Advertising offers our greatest short term opportunity - AdFlashes - from editorial pages, or from directories, to provide attention catchers. There will also be routing from our advertising directory and also the Prestel directory combined with cross references in and out of other, appropriate, information data bases. Ad Flashes already give 4/5 times the page usage figures of non referred adverts. Display advertising offers us a unique opportunity to obtain advertising for national as well as regional use. We know we will have a number of totally new advertisers in this area in 1980. We can also create 'market places' for particular sectors, for example, retail stores, new housing and job recruitment. This type of data base control and simplification is critical to the growth of usage of videotex information. Regionally, we will complement our major display and classified advertisers newspaper space during 1980 and possibly 1981 with a certain amount of 'free' Viewtel space. They will then be encouraged to expand the free space and be charged for the extra. Retail store campaigns will start in the first half of 1980 on this basis. A key area of development will be mail order type goods with particular emphasis on branded goods.

Classified Advertising will occur in a relatively small way during 1980, on a solus sale basis, and through directories. When our classified newspaper ads are reformatted to conform in presentation to videotex routing it will be possible to cross sell into videotex, and bulk update daily without any rekeyboarding. We are not yet convinced that this type of advertising is desireable or suitable for all categories. Market research will be aimed to establish public and business reaction to classified ads on this medium during 1980/81.

Sponsorship

This would provide the opportunity for companies to sponsor pages of information with their Company associated with each and every one of those pages.

Viewtel 202 then represents a modified version of the newspaper package - a broad based news and information service supplemented and complemented by extensive advertising and entertainments services. Our information will have to be as relevant and as

as necessary to the users as we can make it, and at minimum cost.

We are, therefore, setting out in Viewtel to provide a simply constructed package of information covering a wide range of information for the business and residential user. It will have a high volume of traffic on its pages and we believe, over a period of time, it could become a necessary part of its users lives. It will, therefore, be a good medium for advertisers and sponsors and will enable us to get it at minimum cost to the users.

Out of Viewtel 202 on the Prestel service who knows there may be developed a complete Viewtel system in competition with Prestel....

Finally, since videotex is primarily a marketing project, we will be carrying a major market research project to ensure that we know and understand business and residential users needs and reactions to videotex. This will cover people who have voluntarily decided to purchase unsubsidised sets. It will continue for 2 or 3 years on an on-going basis, starting during the first half of 1980. Perhaps the results could be of interest to many people.

Providing Business Information to Prestel

Brian Botten
Managing Director

Fintel Ltd.
London

First in the field to provide business information on Prestel, Fintel has explored and exploited the opportunities which a newly emerging viewdata industry has presented. Whilst the main thrust of the company's activities has been centred upon viewdata/videotex systems, the long term aim to be a data-base producer with outlets through other on-line access systems will not be ignored. Simply, the business of providing information; being an electronic publisher; requires a flexibility of approach to the supply of information and services to a market place which is surrounded by, and indeed often bemused by, the rapid advances in communications technology over a world-wide front.

Background

Perhaps the safest thing to say about providing business information to Prestel/viewdata is that it is a business, but not the sole preserve of those companies labelled as "business IPs", though Fintel is one such company.

With the commitment made in 1977 by its two parent companies, The Financial Times and Extel, Fintel was formed in January 1978 to exploit the electronic publishing market which was clearly going to grow through the '80s and beyond. Fintel's basis for growth was not only to seek ways of distributing business information products electronically, but to market its products and services internationally.

In early 1978 it seemed unlikely that the viewdata experiment in the UK would permit the positioning of the company, both at home and abroad, to be achieved so soon. The phenomenom of a videotex industry seemed remote, though inevitable. Yet the evidence two years later, as witnessed by the events at this conference, clearly indicates that videotex systems, videotex services and in particular Prestel, are here to stay.

In common with any newly emerging industry the positioning and strategy of the principal actors are all important. How long those actors can remain on stage depends on flexibility of attitude and, needless to say, financial support. Everyone is aware of the commercial frailty (some would say suicide) of being a pioneer or market leader. Nonetheless, without the drive, without the risk taking, without the self-belief and marketing thrust, nothing happens. Within that framework Fintel's attitude to what its business is, although not fundamentally changed in the long term has undergone a radical shift in emphasis. This is partly because the nature of the industry has demanded it; partly because the mix of staff and the working environment have allowed that flexibility; but principally because we have to be a commercial success. Operationally the company is a "people business". The distribution of costs shown in Tables I and II (attached) clearly shows the emphasis. But within the next two years the relatively large negative cash-flow must show strong evidence of turning positive.

Fintel Objectives

Clearly our prime objective is to exploit the wealth of information contained, so to speak, in the parental vaults. Extel and F.T. have for long serviced the business community with information and data through a variety of

media, though principally in the printed form.

As with most publishers, the first foray into electronic publishing tended to be a repackaging of existing material. It is extremely difficult not to think in these terms. After all, most information services follow a pattern of repackaging and selling the same information in different forms. Our approach to viewdata was no different, and indeed much of what we do now is still along these lines.

The trick is to supply the value-added content, to place before the user or subscriber information upon which he can act within his decision making process. It has long been said that data is simply data. It only becomes information after the massaging, formatting and authoritative and explanatory comment have been applied.

Fintel's concern therefore in the context of Prestel, is to determine whether or not the viewdata medium is suitable for business information products. As important, if not more so, is the question whether we can find the right type of product which the user will buy, since the product we have to offer is the information and not the vehicle per se.

The Market Trial

From the outset our aim was to set up a discernible test rig for the market place; create an identity for the company; not be too dogmatic as to any particular market sector, e.g. the broking community. In fact, the object was quite the reverse, to examine whether there is a wider need for information in the general business sector. Initially we took information which was easily to hand and which had previously been marketed or proposed as a service. The test data-base was constructed of company news, statistics, comment and abstracts making around 4000 frames which could be viewed as coherent but not necessarily complete. This, based upon around 150 major UK companies, still forms the core upon which other products evolved.

Secondly, the mere fact of being first, the largest, and maintaining an editorial team with "construction expertise" played an important role in establishing credibility as a potential "umbrella" IP i.e. acting as a third party contract house. Further, from a marketing standpoint it allowed the opening up of other avenues into the business market. We found it not sufficient simply to trade upon the F.T. or Extel name. Fintel had to be seen as both different and competent.

This approach has a double-edged effect. The immediate benefit of having a ready made base of subscribers to F.T. and Extel services, such as newsletters or Extel Company Cards, meant that the placing of trial Prestel sets was relatively straightforward. Major corporate clients showed sufficient interest in Prestel on the basis of an invitation by letter. Based on follow-up seminars and interviews concerning the use of Fintel material, the picture then looked somewhat different although not discouraging. The level of expectation of that type of user is naturally high. Corporate librarians are used to receiving or accessing large amounts of information, whether compiled directly or gathered indirectly through services supplied by Extel and F.T., through full on-line access to data-bases like PREDICASTS or the New York Times INFORMATION BANK and many others.

What has emerged is:-

(i) A recognition that the potential of viewdata technology is great, and that information content as well as search facilities will improve.

(ii) Very little comment as to pricing level or strategy, leading one to believe that a "pay as you go" service is acceptable, and that quality information can attract relatively high rates e.g. 15p a frame or more.

(iii) Criticism that there is not enough information and, importantly, it is difficult for the user to know in advance whether his search is likely to be met.

Allied to this is the concept of comprehensive coverage. If, for example, the data-base covers 500 or 1000 companies this is never enough for the professional searcher.

(iv) A discovery that the distinction, say, between Fintel or dataStream or the Stock Exchange is not really apparent to the user: that is to say, many users regard business information as an integrated whole, and will search from one to another.

(v) A discovery that Prestel as a news medium seems relatively popular despite competition from Teletext services as well as conventional broadcast media. In an office environment, with perhaps the exception of Budget Day, radio and TV are seldom used. The need to "look in" to see whats going on, or to

reaffirm a news item, can be satisfied by Prestel.

Lessons Learned So Far

Although it is still too early to be dogmatic, some patterns are developing, and changes of emphasis will be tried.

(i) A more concerted effort will be made to run a Prestel news-wire of events that affect business.

(ii) A universal data-base containing abstracts on all companies over many years is relatively little used (this could change with off-line print capability). Our intention now is to create this universal data-base elsewhere on another on-line vehicle.

(iii) Cross referencing between IP's is being activated to encourage the user in his searching, and to play upon the concept of a "related whole".

A group of business IP's are now arranging with the Post Office to introduce a new level of indexing, probably by industrial sectors, which the Prestel team will maintain with co-operation from IP's.

(iv) To expand a data-base to any size, automatic bulk updating must be used, particularly where frequency of updating is not critical. Fintel's next move will be to examine reformatting and transfer of the Extel EXSTAT data-base (covering approx. 1250 companies including o'seas companies) using the Langton package. Distribution is aimed at Prestel (UK), Prestel International, and overseas videotex services. Importantly, this will be a much more cost effective way of increasing coverage. Simply employing more editors would be extremely uneconomic.

(v) With less than 2000 users the number of frame accesses is around 50-60,000 per month. Expanding to around 50,000 users at the same rate should produce a viable business. The problem is knowing whether this rate will be sustained.

Revenue In Advance

Since revenue from Prestel itself has so far been low, it has become imperative to supplement it to sustain evidence of growth. Broadly this falls into two areas:-

1. The umbrella concept, with variations.

2. Seminars.

The umbrella approach allows the IP to exploit his expertise by offering design and keying facilities to third parties who wish to come onto Prestel as a sub-IP.

Fintel's activities under this generic heading are:-

- Contract services
- Sponsored material
- Corporate advertising

By marketing directly to companies to supply information e.g. Bank Leumi (sponsored material on Israel), outside contractors such as brokers, contract work for American Express, Fintel has grown "umbrella revenue".

Contract work in one form or another means that the IP is not dependent upon user growth. The drawback, however, is that of not achieving a regularly repeatable revenue base. As the sub-IP grows he may wish to take over the work himself.

An important bi-product of dealing with large companies is international exposure and the probability of being the contract agent for overseas systems e.g. Dutch PTT, Bildschirmtext etc. In fact it is now a Fintel policy to have a presence on overseas systems as they emerge. Maintaining a lead position even in a trial status attracts potential business for sale of UK based information delivered in the same (or near compatible) format. The Telset system in Finland now carries Fintel data.

During the next two years, with Prestel usage still low, the emphasis will be on contract work. The marketing and promotional expenses are going to steadily increase to maintain the face of the company in all its guises. Although there may be overt co-operation between business IPs the requirement to keep the company identity in the forefront as a data-base supplier or contract house is vital.

The problem of being buried in the Electronic Bookstall requires a continuous marketing push to achieve visible exposure. One of the critical problems of electronic publishing is that unless you cajole potential users to look at the data-base no one knows it is there. The costs of undoing the blindfold will continue to increase.

On-line Access Window

Recognising that Prestel systems in themselves will never provide all possible information, Fintel is experimenting as an information broker through on-line access. Requests for searches and delivery of results will be done through the Prestel network. This gives an added plus to the armoury of information sources available, encouraging use of the system and allaying the accusation that content is too shallow.

The so-called "gateway principle" to be adopted by the Germans and French offers a fascinating way of overcoming this problem. But there, apart from routeing indexes, the information will not be visible to the searcher. Prestel at least offers a visible and useful content to the searcher. Also most requests are unlikely to come from the sophisticated searcher. To encourage usage, the system must be simple. The potential population of videotex users is going to be several hundred times larger than the "on-line user" population, but all in time are going to expect to reach more information in depth. Fintel's aim is to make the videotex user aware of the facilities which data-base producers offer.

The Future

As was mentioned, the flexibility required of the IP is paramount in the first years. No hard and fast rules are possible until:-

(i) A known population of users exists

(ii) Their expenditure rates, search patterns, particular requirements are better known.

(iii) Terminal supplies are assured and reliability of system and user equipment is good.

Fintel has placed little reliance on any particular rate of progress being achieved by the system operator and terminal equipment suppliers. Forecasting has proved to be a dangerous game. However, it is essential that the above factors are better understood; that a service exists; and that the Post Office continues to invest, creating the mechanism for a service, otherwise the users won't come.

It is paramount that the marketing efforts of the IP, much of which has been educational, is supported by the other two principal agencies. Potential user interest in business is high. Crises of confidence reflect badly all round. The potential user is becoming more discerning. Revenue from advertising, sponsorship etc. is vital for

the IPs, and will reduce the cost to the user. It is not sufficient to say that the business user will always pay up. His respect has to be earned.

The present economic uncertainty of the '80s will not help the selling of information services, even though they may be pre-requisites for good management. There is, however, a sustained belief that:-

a) information will be distributed and retrieved electronically

b) the management of information will be the key to success in running a business

The information revolution of the '80s, it is suggested, will rank in importance with the industrial revolution which went before. Above all, it is a communications revolution. The vested interests of the communications authorities and computer hardware manufacturers are enormous. They will want to encourage information. The heart of their activities, in revenue terms, is the business sector. The aim of the business IP, therefore, is to recognise these forces and be prepared to influence and participate in developments and capture their share of a multi-billion dollar industry.

TABLE I - BREAKDOWN OF COMPANY COSTS

EXPENSE ITEM	% TOTAL COSTS
1. Manpower	41
2. Communications + Prestel Charges	12
3. R&D + Consultancy	11
4. Office Space + General O'hds.	23
5. Promotional	7
6. Other	6

NOTE: Approx. 80% of all costs are attributable to Prestel/viewdata activities.

TABLE II - BREAKDOWN OF STAFF & SALARY/COSTS

1980 level - 15 staff with provision for 2 additional editors

	FUNCTION	NUMBERS	% SALARIES
1.	Management + Secretarial	3	23
2.	Editorial	5+(2)	28
3.	Marketing + New Contract Work	4	31
4.	Research & Development + Programming	3	18

NOTE: There is at least a 50% contribution to editorial design and keyboard activities provided under item 3.

What Kind of Pictures for Videotex?

A Discussion on the Future of Videotex Terminals and Display Technology

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The paper discusses the enhancements to UK Prestel requested by information providers, and concludes that improvements in display technology, although important, are not those required most urgently.

The major display facility unavailable at present is the ability to display coloured pictures of the photographic type. This would be valued by electronic publishers in general and by advertisers in particular.

Work carried out at the Post Office Research Centre indicates that such facilities are likely to be economic in a few years time and should form the basis of "second generation" Videotex.

1 INTRODUCTION

The years since the announcement of viewdata in 1975 by the British Post Office (Fedida, 1) have seen intense international activity regarding the new technology of electronic publishing. Within the United Kingdom, the parties concerned (the British Post Office, the BBC, the IBA, the British Radio Equipment Manufacturers' Association and the Information Providers /IPs/) have concentrated on the rapid introduction of the Prestel service based on viewdata technology and ISO 646 coding standards. Elsewhere international activity has centred around a major debate on coding techniques and on the development of alternative systems which differ from viewdata mainly in their display technology. This turn of events has given rise to a somewhat distorted international view of electronic publishing, for experience in the United Kingdom has proved that although display technology is important it is not the area in which most of the technical problems of public videotex services lie. One lesson learnt early in the UK is that simple and effective data input facilities are as important as data display facilities. IP's costs are dominated by this activity and the more tha an IP attempts to exploit the rapid update capabilities of Videotex the greater the importance this assumes. Other technical problems at the central computer concern the maintenance of an interlocking network of computers (assuming that the UK requirement of a simple uniform protocol for information access is required), the identification of TV sets for billing purposes and the collection and accounting of IP revenue. The last two functions must be performed to high audit standards. The policy of adopting modems integral with the TV set, essential for the maximum penetration of the domestic market, gave rise to problems of electrical safety and the solution of these problems required considerable engineering design skill. It is IPs rather than the PTT who are the ultimate judge of the facilities required. The first list of additional facilities required by the UK IPs was forty items long, but requests for improved display features were well down this list, although other items such as the priority transmission of certain frame updates (required for betting purposes) and facilities for cash transfer were requested urgently. The IPs concerned with the quality of display were those who wished to illustrate products for sale. A jeweller, for example, was disappointed at not being able to reproduce the art photography usual in the promotion of his wares. The photography in question lent heavily on subtle variations in tone and on the depiction of finely curved outlines. Thus Prestel concluded that display enhancement was indeed of long term importance, provided that it could ultimately offer full colour pictorial representation, but in the short and medium term enhancements in areas other than display technology were of prime importance. This assumption has formed the basis of UK R&D strategy.

2 THE MAJOR VIDEOTEX DISPLAY TECHNOLOGIES

Let us now compare the display technologies of four of the major Videotex systems announced so far. These are Prestel (based on the original viewdata system), Antiope (the French system announced in 1976), Telidon (the Canadian system announced in 1979), and CIRCLE (a Japanese system demonstrated by NEC at Communicasia 79).

2.1 Prestel (Viewdata)

This employs a method of picture creation known as alpha-mosaic. The display space normally occupied by an alphanumeric character is occupied by a graphics character consisting of six small squares, arranged in two columns of three. Each square may be either illuminated or left blank. Associated with each character are attributes such as foreground colour, background colour and whether or not the character is to flash. Usually the attributes will be identical to that of the preceding character but changes, when required, are indicated by the receipt of special control characters. Prestel uses serial attribute coding, in which the attribute codes are placed consecutively in the same memory as the characters themselves. When a change of attribute occurs the attribute control codes precede the relevant display character. The attribute codes can in certain circumstances affect the display by causing blank spaces, although this effect can be minimised or obviated by the use of the background colour facility and of a control character known as "hold graphics". This causes the last graphics character displayed to be inserted where the space caused by the control character would have been. There are three advantages to serial attribute coding. The first is that only 1 Kbyte of memory is required, so minimal terminal costs are obtained. This is important for equipment aimed at the domestic market even though memory costs are falling, because a substantial "mark up" on component cost occurs. UK experience is that the speed of penetration of the home market, where other consumer products are competing for the consumers' discretional income, is dependant on the achievement of minimal costs.

The second advantage relates to broadcast teletext. Coding compatibility between data transmitted by the broadcast and telephone media is required for the domestic market but the coding scheme must offer broadcast transmission security under conditions of noise and multiple path propagation. In order to gain this security many broadcast engineers advocate a system in which one TV line is allocated to the transmission of one line of displayed text, with the data coded in a synchronous form. If, for simplicity and cost reduction, there is to be a simple correlation within the terminal between the way in which the characters are transmitted and stored then this method implies the use of serial coding because the characters are transmitted in serial form. A full discussion on these issues can be found in reference (2).

The final advantage relates to the central computer system. One effect of serial coding is to limit the number of characters required in the computer for the display of one page of information to 1 Kbyte. This has substantial advantages for the computer software system programmer, because although variable page size disc storage allocation strategies are possible, simple fixed page-size storage strategies minimise computing overheads, access times and editing problems, see ref (3).

2.2 Antiope

This uses parallel attribute coding. Eight additional data bits are associated with each stored character. Thus 16 bits are required to store a character, 8 being used to define the character and 8 for the definition of its attributes. These 16 bits would be addressed simultaneously. The advantage of parallel coding is that the attribute definition never interferes with the display and marginally more elaborate pictures can be created. The disadvantages are that the cost of the terminal is increased, intrinsic security for broadcast teletext does not exist, and the use of simple fixed storage algorithms in the computer is not possible. On the second point attempts have been made to increase the security of parallel attribute coding schemes by the insertion of redundant carriage return and line feed codes, and although this does increase transmission security to a degree, the redundant characters are an additional overhead in a coding scheme that can already give rise to very large page sizes. The third point is illustrated by reference to figure 1. This compares the distribution of page sizes (ie the number of characters per page) for serial and parallel systems. The serial data is taken from Prestel and is based on an analysis of 46000 live pages. The parallel data is based on a limited but typical sample of 49 pages which illustrate the enhanced graphical capability of Antiope. Thus the computer programmer for a parallel attribute system will be faced with the choice of exploiting the graphics capability to the full and thus abandoning hope of working within the 1K limit or retaining the 1K limit and not fully exploiting its graphics capability.

2.3 Telidon

This method encodes and transmits the information in cartesian and/or conic form. For example a circle would be transmitted by the coordinates of its centre and its radius. The technique is well known in computer aided design (see ref 4) and was introduced to videotex by the Canadians when they announced Telidon in 1979. Its terminals employ alpha-geometric graphics with "bit plane memories" of 40 Kbytes, in which the data to be displayed over the entire area of the screen is represented on a dot by dot basis

rather than created by a character memory and character generator. It has two advantages, one undisputed and one debatable. The undisputed advantage is that much finer pictures, in terms of diagonal lines and circles can be created. It is also claimed that the technique has a degree of "terminal independence" and is more capable of accommodating future improvements in display technology, although the extent to which this theoretical advantage is exploitable in engineering and commercial practice has yet to be proved. The chief disadvantages relate to costs.

At present alpha-geometric decoders cost almost 10 times as much as serial attribute alpha-mosaic decoders and an authorative Canadian estimate is that they will be 50% dearer even with bulk production, large scale integration and lower memory costs. Moreover IP costs when editing and creating pages are increased substantially. Whereas mosaic system editors require only an additional keyboard for use in conjunction with a standard Videotex television receiver, alpha-geometric IPs must have a dedicated computer costing around £20,000. Chitnis and Costa (5) have argued that improved page layout and other benefits justify this initial capital investment by IPs, but experience in the United Kingdom would indicate caution on this point. Electronic publishing is indeed likely to be profitable for IPs but many of them can expect fairly substantial negative cash flows in the early days of a new service and it may be unwise to accentuate this by imposing on them the need for major new capital investment. Moreover, it is the hope in Europe that Videotex will widen the market for published information and render it more accessible to small publishers, minority opinion, and specialists of all kinds. In this sense it might be appropriate to regard it more as an electronic duplicating machine than as an electronic printing press and steps that take it back down the road towards larger conglomerations of expensive equipment might not be desirable.

Although in most respects alpha-geometric bit plane terminals can present superior displays there are some facilities such as flashing that they can implement only in a more limited form than character oriented displays. Thus some of the simple animation effects common with character displays cannot be achieved.

Finally, work on the transmission of alpha-geometric information in broadcast mode is still in its formulative stages (see Brown et al (6)) so that the agonised debates on broadcast data transmission security that have taken place in Europe with respect to alpha-mosaic systems have yet to begin for alpha-geometric systems. Pictures coded in alpha-geometric form are more susceptible to corruption by transmission errors and much work remains to be done in this area.

2.4 CIRCLE

The acronym is derived from Community Information Retrieval with Communications Linkage. It was announced at Communicasia 79 by NEC, Japan and was portrayed as a videotex system. A range of facilities including the transmission of still pictures, moving pictures, speech recognition and recorded audio information were demonstrated. The system differs from previously demonstrated videotex systems in that the use of broadband transmission links is essential. This raises a number of important questions. The first relates to the date at which such transmission facilities to the customer will be sufficiently wide-spread to support viable IP activity. Here there may be a difference between countries that use character based alphabets and those that do not, for the difficulties in coding Japanese and Chinese style characters may mean such countries are forced to await wide band-width local circuits before they can offer effective domestic information retrieval services, whereas countries with character based alphabets can provide the service on narrow band-width circuits. Secondly since videotex services, almost by definition, use public switched communication services (either telephone or data) in order to access a range of computers the data rate that can be switched at the exchange becomes as important as that obtainable on the transmission link, and is likely to be lower. A final question on CIRCLE regards the updating of information. This is crucial to the success of any electronic publishing exercise and the updating of videotape and audio response files in an economic manner requires much further investigation. These questions are, to the knowledge of the author, unanswered in work published so far.

3 PICTURE PRESTEL

How then does the British Post Office see the development of Prestel? Let us first consider the relevance of the techniques described above. Bearing in mind that parallel attribute and alpha-geometric coding both have disadvantages as well as their advantages, we see little merit in changing to either. The major concern of all the parties in Britain is to achieve bulk TV set and information sales using the proven TV models that are now in production, and the existing data base. The early months of public service indicate that Prestel can be profitable in both the business and domestic markets but that this profitability would be jeopardised both by the three year disruption of service which would accompany any change of standard and by the increased costs that would be associated with either parallel attribute coding or alpha-geometric coding. Thus no pressure will be exerted by the Post Office on either the IPs or the TV industry to change standards. A word of qualification is necessary here with regard to the new draft standard for videotex codes which is being progressed within CCITT and CEPT. This standard makes provision for

both serial and parallel attribute coding and the UK system is accommodated within it. Some people maintain that the falling cost of LSI circuits and memory will make the production of dual standard decoders economic. Having seen the timescales and tooling costs involved in the early years of UK Prestel and broadcast teletext the author regards this view as somewhat optimistic, but if multistandard decoders are produced cheaply, and if the British TV industry and IPs wish to exploit them, then the modification of the software on the Prestel computers could in principle be carried out. This qualification does not, however, apply to the much more complex alpha-geometric coding, because the costs quoted above would be sufficient to ensure that there will be no domestic market for such receivers within the next five years and there is a dichotomy in the arguments advanced for such systems. On one hand they emphasise, even more than Prestel salesmen, the value of the business market. This is seen as being more capable of bearing the cost of improved graphics and yet it is the business sector which is least interested in fine pictures and which can make most use of plain textual information - even in black and white. What alpha-geometric graphics offer, for its increased costs, remains a highly stylised form of graphics. Now videotex is an electronic newspaper, and most newspapers use stylised graphics in only two places - the weather map and the cartoon. Photographs, however, are used frequently for editorial and advertising material and a photographic technique would therefore be most useful.

With respect to CIRCLE the demonstration of photographic facilities is impressive but more oriented to the 1990s than the 1980s because of the transmission technologies required.

Thus we can list the major requirements for second generation Prestel. It should be coordinated with both the transmission and switching systems being developed for the future, so that it can coexist with other telecommunications services, and the capabilities of new systems such as CDSS1, System X and packet switching must be taken fully into account. Photographic representation is regarded as essential, editing should be cheap and convenient and compatibility with broadcast teletext remains extremely important.

Research carried out by the Viewdata and Visual Telecommunications Divisions of the British Post Office Research Centre indicated that the provision of coloured picture inserts for Prestel pages was possible by one of several picture coding schemes, at a range of transmission speeds. A system based on the coding system known as differential pulse code modulation (DPCM) has been implemented for demonstration purposes. The IPs photograph is placed beneath a conventional TV slide scanner and the resulting signal is processed by software to produce a 4 bit DPCM representation (ie 4 data bits per picture element for luminence) which can be stored in a series of conventional Prestel data frames. This process is fully automatic, and no manual composition is required of the IP, other than to

position the picture on his page. About 8 frames are required and bearing in mind the long term trends in bulk storage costs this is regarded as reasonable.

At present two speeds are being demonstrated for the transmission of the picture to the customer, 1.2 Kbps and 4.8 Kbps. 1.2 Kbps is the transmission speed of the present Prestel system, so if this speed were used no additional computer ports would be required in the Prestel network. The picture takes about 1 minute to build up using DPCM and 1.2 Kbps. This is somewhat slow, but could well be acceptable where the customer has definite information requirements, for example, when deciding whether or not to visit a house on an estate agents' list. At 4.8 Kbps, which is likely to be obtainable at reasonable cost on the existing telephone network, build up takes about 15 seconds, which is quite acceptable. Future generations of telephone exchange such as the CDSS1 private exchange and System X are likely to offer 64 Kbit switched circuits and will thus offer the choice between build-up times of about a second or larger pictures. (The coding technique may change for these higher speeds.)

At the terminal, an additional memory of 24 Kbytes is used for storage of display information. This gives a picture that is typically 1/3 full screen height and 1/3 full screen width, although the aspect ratio of the picture insert may be varied at the IPs discretion to permit, for example, the depiction of a tower. Pictures created by this method are fully compatible with broadcast teletext. Using DPCM, the picture is built up vertically on a line by line basis. The use of transform picture coding techniques would permit the rapid transmission of a low definition image the resolution of which was then gradually improved. This would enable the customer to reject irrelevant pictures quickly, in addition, the use of transform coding could ultimately reduce the number of bits required for the transmission and storage of pictures by a factor of about 3.

The major components of a Picture Prestel terminal are a memory that is larger than that of a conventional Prestel terminal, and increased processing power probably provided by a microprocessor. These components can also be used to provide other facilities, such as:-

a) Telesoftware, which is the receipt of microprocessor programs for games and calculations from Prestel.

b) Dynamically Redefinable character sets, in which the terminal is automatically reprogrammed to interpret the transmission codes in special ways to produce a wide range of symbols. Examples are knives and forks for travel timetables and circuit symbols for computer aided electrical design work.

c) The local storage of several conventional Prestel pages.

Further commercial evaluation of such facilities is required before the specifications of second generation Prestel is complete but the promise of "Picture Prestel" is such that a change to intermediate

graphics systems is unlikely to be worth while.

Acknowledgements

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References

1 FEDIDA, S. "An Interactive Information Service for the General Public", Proc. European Computing Conference on Communications Networks. Page 261-282. 1975.

2 "Teletext Alphabets and Error Protection", EBU Review Technical No 173, February 1979.

3 CLARKE, K E. "The Post Office Viewdata Service", International Broadcasting Convention, London 1978, also reproduced in the Journal of the Royal Television Society, Vol 17 No 5 Pages 49-53.

4 SUTHERLAND, I E. "A Man Machine Graphical Communications System", MIT Lincoln Laboratory Report TR 296, January 1963.

5 CHITNIS, A and COSTA, J M. "Videotex Services: Network and Terminal Alternatives", IEEE. Transactions on Consumer Electronics Vol CE-25, No 3, June 1979 Page 269.

6 BROWN, H G et al. "Telidon. A New Approach to Videotex System Design", ibid P 256.

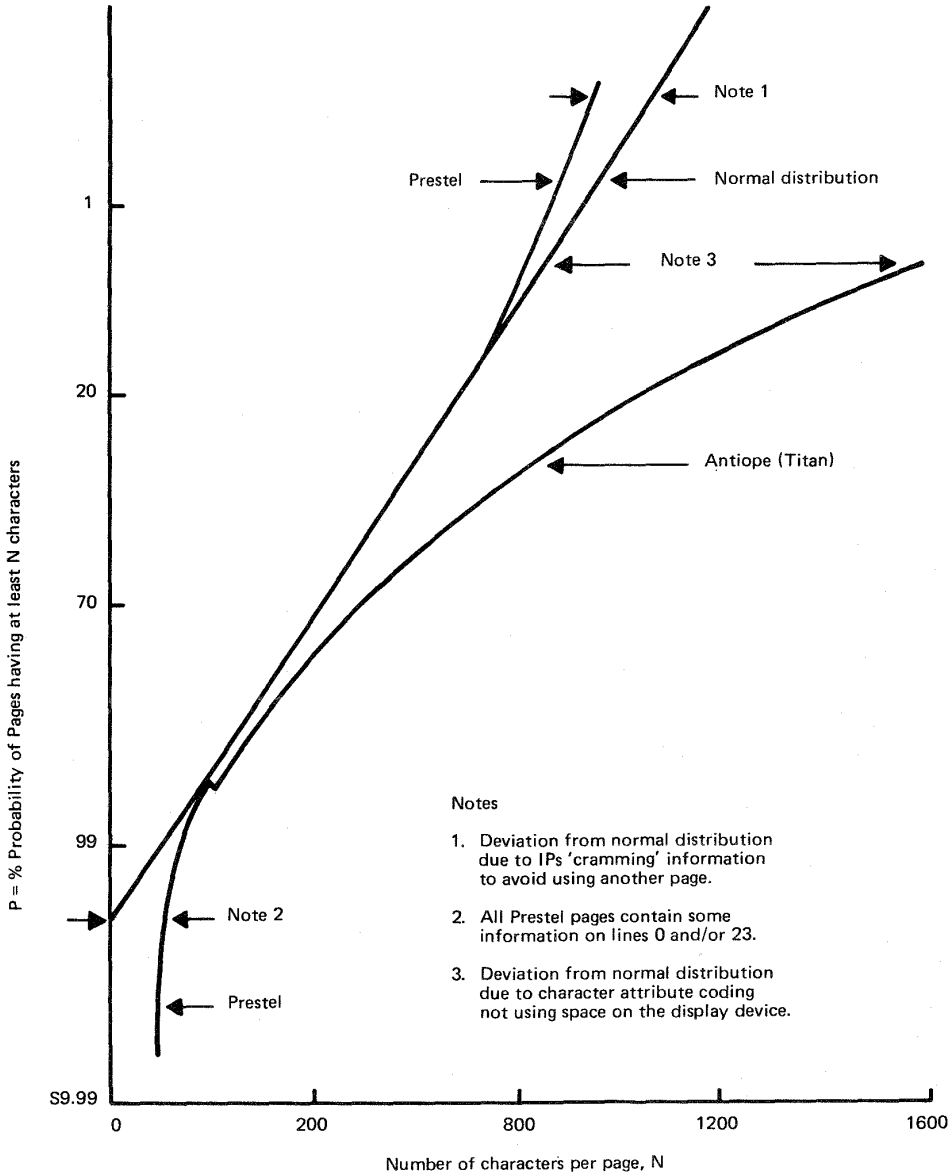

Fig. 1 ANALYSIS OF PRESTEL AND TITAN PAGES

CAPTAIN System Features

--- Presentation Capability and Transmission Method ---

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The CAPTAIN system, of which the trial service was inaugurated in December in 1979, is an interactive videotex originally developed in Japan. The greatest feature of the system is that it has a large capability of displaying figures. The CAPTAIN system adopts "pattern transmission system", which allows clear display of as many as 3,000 Kanji characters (Chinese characters) and freely composed patterns. One of the major drawbacks associated with pattern transmission systems, however, is the longer time required for forming a frame, as compared with the code transmission system which is in operation in other countries. This drawback has been greatly overcome by the combination of various techniques to increase the transmission rate of signals and to compress redundancy with one-dimensional run-length codes and well-designed displaying methods. As a result, the time required for forming a frame is reduced to 10 seconds on the average.

This paper presents characteristic techniques involved in the CAPTAIN system, such as display functions, display methods and transmission method, and also proposes the hybrid transmission method that mixes pattern and code transmission systems as a means to further shorten the time required for forming a frame.

1. Introduction

Television broadcasting is a mass communication media with images. Its major drawbacks are that it sends information only one-way and simultaneously, and also information which can be optionally selected is limited.

Demands have been growing for media that can supply necessary information as required to satisfy specific needs of viewers. In order to meet these requirements that cannot be fulfilled by conventional mass communication media, many countries have been developing a center-to-end, request-response type information system with still images stored at a center.

These systems, generally named videotex systems, supply still images consisting of characters and patterns as required, provide economical mass communication media. Users can receive information on their own television sets through exsting telephone networks by installing an adapter provided with several functions.

This paper presents the CAPTAIN system of which the trial service was inaugurated in Japan in December 1979.

2. Information Transmission System

Two systems have been developed for the transmission of characters and patterns; the "code transmission system" and the "pattern transmission system". The former sends coded information that is converted into characters and patterns in a pattern generator at each terminal, whereas the latter transmits to users information that is already converted into characters and patterns in a pattern generator at a center. The code transmission system is more economical for transmitting relatively small number of characters and patterns, and hence suitable for European and American countries. This system, however, requires very large generation equipment at each terminal with freely composed patterns or many types of character. The CAPTAIN system uses the pattern transmission system for Japan, where as many as 3,000 Chinese characters with complicated shapes are used. The pattern transmission system has other advantages of larger allowances for errors in transmission and simpler terminal equipment.

3. Display Functions

3.1 Composition of a Frame

The CAPTAIN system generally uses a home television set as a user terminal to display information.

The maximum number of Chinese characters readily readable will be 15 characters by 8 lines on the screen of a home television set. Kana, alphabetic, or numeric characters can be halved in size.

The number of lines available for the display is about 400 from the displayable range with the television set using the NTSC method. On this basis, information is displayed with 204 dots vertically by 248 dots horizontally on a frame to make the intensity of the image element half that of the line. The number of dots for a font of a Chinese character is fixed at 18 vertically by 15 horizontally from the following considerations. A compromise is made between the transmission cost and accurate display for educational purpose. Chinese characters typically require more horizontal lines than vertical lines. An odd number is more favorable for a

horizontal row of dots, because many Chinese characters are symmetrical. In addition to the above standard-size for sentences including Chinese characters, medium- and small-sized characters are available (see Table-1) in order to display as many characters as possible on a screen.

Patterns are displayed either in an optional manner with dots or in a mosaic with 186 pattern elements prepared before hand.

Table 1. Outline of Character and Pattern Elements

Size of character	Number of dots allocated	Type of character	Available number of characters or patterns
Standard-sized	18 dots vertically by 15	Chinese character	2987
		English character, numeral, kana character and mark	566
		Special symbols including weather symbols	4
Medium-sized	11 by 7	English character, numeral, kana character and mark	356
Small-sized	9 by 7	English character, numeral, kana character and mark	230
Pattern element	12 by 8	For graphs and patterns	186

A frame consists of 31 by 17 units called sub-blocks which are 8 by 12 dots as shown in Fig. 1. The uppermost row of the sub-blocks displays image numbers or monitors and is named the header section. The right-most sub-blocks are for punctuation symbols only. A standard-sized character is arranged in four sub-blocks (a block), a medium-sized character in two sub-blocks, and a small-sized character and pattern element in one sub-block. Therefore, an image can contain, at the maximum, 120 standard-sized characters, typically about 180 characters when standard-and medium-sized characters are mixed, and 480 small-sized characters.

Photo 1 shows the image samples.

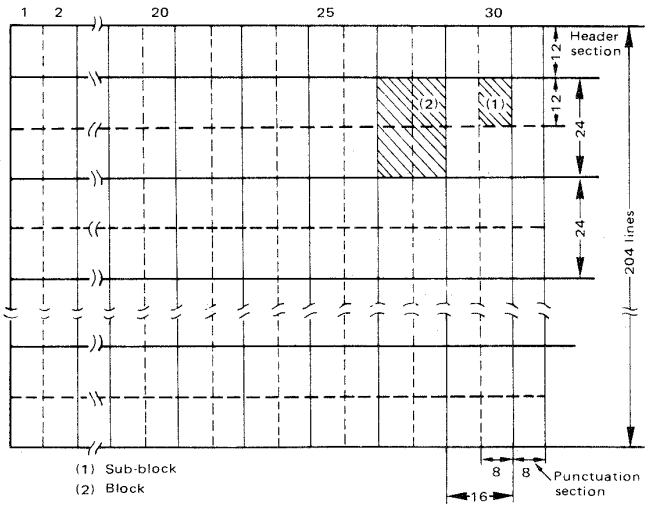
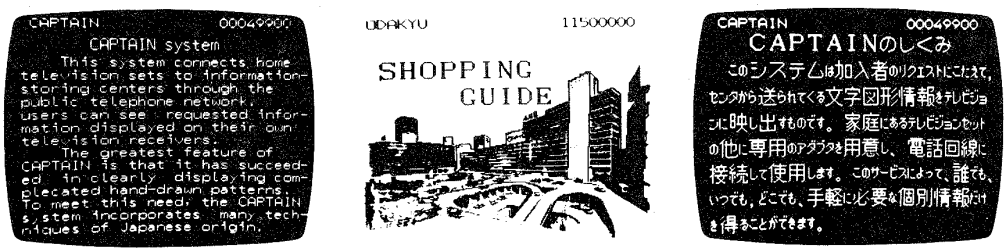


Fig. 1. Composition of a Frame



(1) An image in English (2) A free composed pattern (3) An image in Japanese

Photo 1. Image samples for the Captain system

3.2 Coloring function

Characters or pattern are colored in sub-blocks following colored information in red (R), green (G) or blue (B). Eight colors are available, black, blue, red, magenta, green, yellow, cyan and white.

There are two color-display methods; normal and inverse coloring. In the normal coloring method, bright parts of sentences or patterns are colored while others are shown in background colors. In the inverse coloring method, on the other hand, bright parts are colored white and other parts in specific colors. This method is suitable for displaying characters inside of a pattern.

The background color can be chosen, as is the case with a character or pattern, from the eight available colors, and brightness of a background color is lower than that of a color for a character to produce higher quality images — images less irritant to the optic nerves and to give higher contrast between character colors and background colors.

3.3 Flashing Function

The system is also provided with a flashing function in order to attract user attention; characters or patterns switch between specified colors and background colors in a given cycle. Characters or patterns can be flashed anywhere in a designated section on a screen.

3.4 Monitor and Message Display Function

A special section is provided in the header section for displaying monitors in inverse coloring to monitor a key pad input at a user terminal. The center may sometimes send messages, which are flashed in the header section.

4. Display Methods

The CAPTAIN system used five display methods, shown in Fig. 2.

Images are stationary in the frame type display, whereas they move upward at a constant rate in the scroll type.

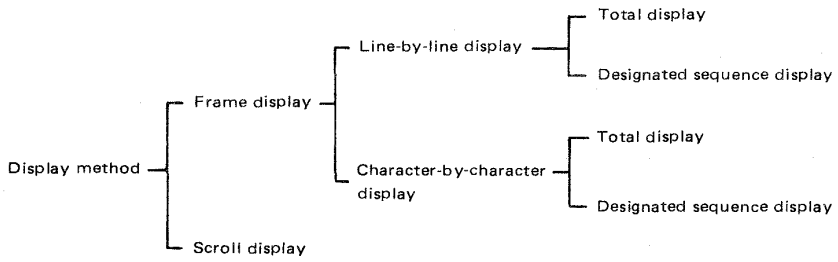


Fig. 2. Five Display Methods Available in the Captain System

The frame display is subdivided into two types; images are shown in rows successively from top to bottom line in one method (the line-by-line display) and from left to right, one character after another in the other method (the character-by-character display). In the latter method, images are vertically scanned in four bits for ease of handling and in consideration of the sense of sight.

In each of the above sub-divided methods, images can be displayed either in an orderly manner from the top to the bottom (the total display) or from any row following a display sequence that can be freely designated (the designated sequence display). The display sequence can be optionally changed by providing each image with information of display position and by altering the transmission sequence accordingly.

5. Transmission Format

Images are transmitted from a center to user terminals in packets together with flags that indicate the start or end of a packet (Fig. 3). Fig. 4 shows packet types and formats.

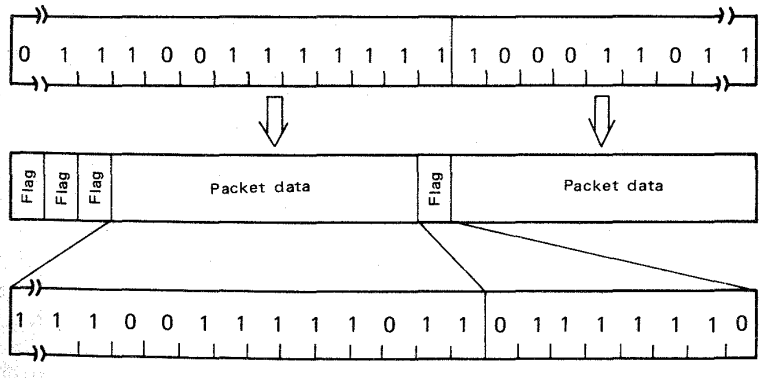


Fig. 3. Transmission Format from a Center to User Terminals, Flag, Packet Data

Packet type	Byte sequence / Size	1	2	3	4	5	6	
Image control packet	6 bytes	Identification code	Display mode	Background color information of display section	Background color of header section	Flashing color	Spare	
Color information packet	34 bytes	Identification code	Display position		Specified color 0	Specified color 1	Specified color 2	Specified color 30
Horizontally-scanned-pattern packet	34 bytes	Identification code	Display position		Pattern data (248 dots)			
Horizontally-scanned, compressed pattern packet	34 bytes maximum	Identification code	Display position		Compressed pattern data (one line)			
Character-by-character display pattern packet (medium-sized character)	21 bytes	Identification code	Display position		Pattern data (8 dots by 18)			
Character-by-character display pattern packet (small-sized character)	28 bytes	Identification code	Display position			Pattern data (16 dots by 12)		

Fig. 4. Packet Types and Formats

The image control packet is sent at the head of any information image to transmit basic and overall information (display method, background color, etc.) for composing images. The color information packet transmits color information of 31 sub-blocks in sub-blocks. The horizontally-scanned pattern packet transmits the pattern information to be displayed in line-by-line and scroll methods, while the horizontally-scanned compressed pattern packet transmits the pattern data that are coded in lines into one-dimensional run-length codes when they are displayed in the line-by-line method. The character-by-character display pattern packet for medium-sized characters transmits pattern information made of one medium-sized character for character-by-character display. The number of dots transmitted is 18 vertically by 8 horizontally. A standard-sized character is sent in two packets. The character-by-character display pattern packet for small-sized characters is concerned with pattern information consisting of small-sized characters and/or pattern elements for the character-by-character display. The dot number is 12 vertically by 16 horizontally (sufficient for two sub-blocks).

No specific transmission procedures are fixed for the CAPTAIN system due to the relatively large allowance for transmission errors as one of the major characteristics of the pattern transmission system. The system free of any specific transmission procedure, however, cannot remedy errors in coded information such as the packet identification code, image control information, color information, and information for display position, which are included in image information transmitted by the pattern transmission system. For this reason, Hamming check bits are provided to correct one-bit errors and to detect two-bit errors in coded informations.

In the pattern transmission system, a bit configuration sharing common arrange-

ment with that for a flag pattern appears in the pattern data and may be erroneously processed. As a countermeasure against this type of error, a bit is processed by a procedure similar to that used in the High Level Data Link Control (HDLC) procedure shown in Fig. 3.

6. Method to Shorten the Time Required for Forming a Frame

As compared to the code transmission system, the pattern transmission system has the advantage of displaying more diverse patterns, but the disadvantage of the longer time required for forming one frame. The reduction of the time, one of the most vital concerns for the CAPTAIN system, is realized by the following techniques.

(1) Improvement in transmission speed

Vestigial side-band, 2-phase differential phase modulation (2-phase PM-VSB) is used as a modulation/demodulation method in order to secure stable and high-speed image transmission through the public telephone network. A phase modulation/demodulation method is desirable for services with widely varying amplitude characteristics. Image transmission has been carried out on an experimental bases at two transmission speeds; 2,400 and 3,200 bits/second. The error rate with pseudo-random codes is about 10^{-6} at the transmission speed of 3,200 bits/second and S/N ratio of 17dB. This arrangement allows phase equalization equivalent to one transportation link at the demodulation side. In order to transmit requests from users, reverse channel of 75 bits/second is provided using the FSK method, thus permitting full duplex transmission.

(2) Redundancy Compression

The time required to form a frame is shortened by the compression of redundancy involved in pattern data and also by coding the data into one-dimensional run-length codes. An average compression ratio is predicted to be around two by computer simulation. As a result, the estimated time required for forming a frame would be about 10 seconds on the average at a transmission speed of 3,200 bits/second.

Redundancy compression is achieved based on the following considerations;

(i) If all of the pattern data in a packet are composed of information without brightness, such as those for a space between lines in the case of line-by-line display or an empty space in the case of character-by-character display, the packet is not transmitted.

(ii) Pattern data are reduced into one-dimensional run-length codes, and judgement is made for each line whether a packet length could be shortened by the compression or not. A shorter packet is to be transmitted based on this judgement.

(iii) In compressed pattern transmission, the final run of the runs composing one line is not transmitted, and the run is produced when a terminal receives the end flag, in order to improve the compression effects.

(3) Consideration of Display Methods

If new images can be recomposed by partially modifying those which are already displayed, modified parts only are transmitted. Identification codes are applied beforehand to parts that should not be converted.

7. Outline of User Terminal

The common user terminal consists of a line connector, adapter and remote-

control type key pad in addition to a telephone and television set. Fig. 5 shows the composition of the adapter. Received image information is demodulated in the demodulation circuit, and is written in the designated position in the pattern or color information memory in accordance with transmission format. In the case of compressed pattern transmission, it is written in after expansion. A 64K bits memory including the pattern and color information memory is provided.

Information is displayed on television sets after under-going following steps: Pattern and color information are read out from the memory with a frequency synchronized to 8/5 times that for the color signal sub-carrier of the standard color television signal, RGB signals are synthesized and converted into a composite television signal by a color encoder and RF-modulation. The luminance signal component for some of the color signals is emphasized from the standard level to improve the image quality by compensating for the limited band of the chrominance signal. This consideration is based on the facts that the high read-out bit rate is required when displayed, and there are many characters that do not require horizontally-arranged dots to be continuously connected.

The remote-control type key pad is used to connect/disconnect the adaptor power source, switch the line from the adapter to the telephone, and issue requests for information. The output, after being demodulated and analyzed at a user terminal, is transmitted to a center through the reverse channel. As the carrier, infrared rays modulated at 55kHz are used in order to avoid competition with other remote-control type devices.

In addition to the above terminal equipment, an RGB-driven, built-in type adapter is available. In this device, an adapter and the function of the line connector with a CRT display are integrated.

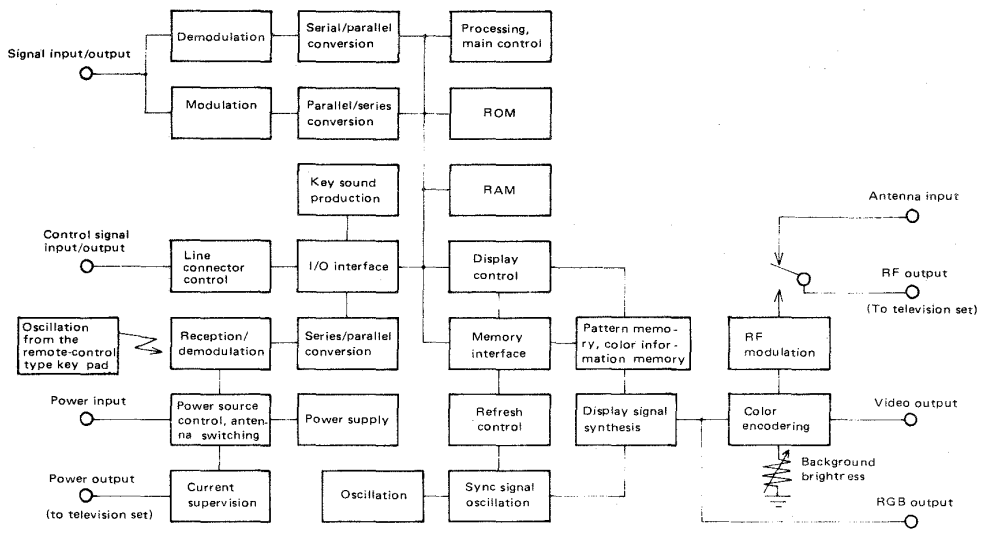


Fig. 5. Block diagram of adapter

8. Outline of Trial System

The trial system consists of an image conversion center, information center, information input terminal, user terminal and telephone network, as shown in Fig. 6.

The image conversion center consists of a line unit, image conversion unit, image file, and a main control unit which controls them. The main functions of the center are control of terminal connections, reception and analysis of requests from user terminals, issuance of data retrieval requests to the information center, conversion of coded images into adequate forms to be displayed at terminal, and overall supervision of the system. The design capacity is 70 erlang.

The information center stores images sent on-line from the information input terminal, and retrieves and transmits them as required from the image conversion center. The storage capacity is 100,000 images including those stored in the image conversion center and information center.

The information input terminal is provided with functions to input, compile and modify coded characters and patterns, and to directly input hand-written patterns based on facsimile principles. Types of information to be input are image information, image supervision information and, information for selecting images to be displayed next, in order to respond to requests from user terminal.

User terminals are connected to the CAPTAIN center via the image information center and telephone network. An ID number to identify each user terminal is issued from the electronic exchange that contains the terminal when the line is connected.

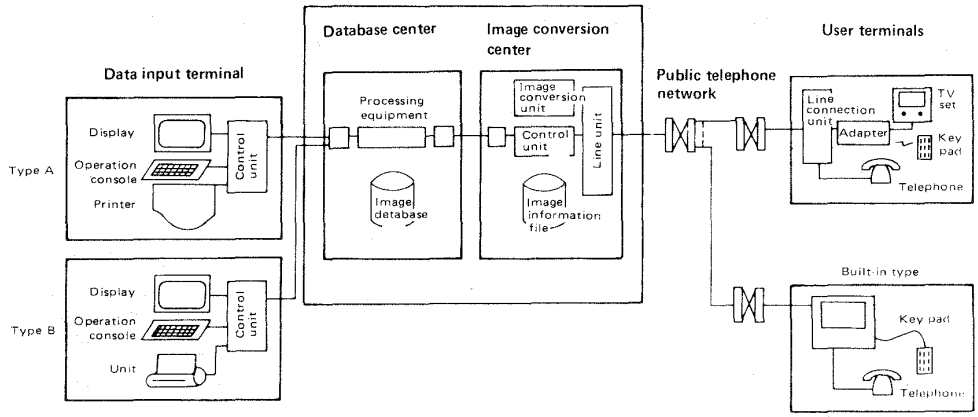


Fig. 6. CAPTAIN System configuration

9. Procedure of Use of the CAPTAIN Service

To allow users without special technical knowledge to freely use the Captain service, its operating procedures have been simplified.

A user telephones the CAPTAIN center after connecting the terminal to the power source. On hearing an audible signal informing him that the line has been connected, he switches the circuit from the telephone to the CAPTAIN adapter using the button on the line connector. Requests for information are made through a key pad. The user can select necessary information by entering indices from those displayed on the screen, or by directly entering information index numbers listed in the Information Guide Book. The key pad has several functions in addition to the function for requesting information, as summarized in Table-2.

Table 2. Function keys

Key types	Functions
NUMERAL Key (0-9)	NUMERAL key (0-9) is used to directly specify index numbers, or items from those displayed on the television
*** Key**	*Key is used to directly specify index numbers, or to request special requirements (Users push this key, numeral keys and finally * key when directly specifying page numers).
# Key	# Key is used to specify index numbers or desired items (when this key is pushed, monitor display disappears and the center starts to operate as requested).
STOP/START Key	STOP/START key is pressed to pause pictures. Images pause when this key is pressed, and start when pressed again.
CANCEL Key	CANCEL key cancels numerals or * symbol.
ACKNOWL-EDGEMENT Key	ACKNOWLEDGEMENT key is used to cancel message transmitted from the center. When this key is pressed messages are replaced by original image.
RETURN Key	RETURN key displays images in accordance with users initial request.
REVIEW Key	REVIEW key displays again information already shown. Images can be replayed up to three frames in succession.
REPEAT Key	REPEAT key requests retransmission of images (for example, when display is poor). On pressing this key, the same images are repeated.
DISCONNECT Key	DISCONNECT key disconnects the line with the center and images remain on the television.

10. Future Development Plans

10.1 Hybrid Transmission System

As mentioned above the pattern transmission system, as compared to the code transmission system, has the advantage of displaying more diverse patterns, but the disadvantage of the longer time required for forming a frame. Although the disadvantage has been greatly overcome for the CAPTAIN system by the combination of several types of technical breakthroughs, there is still room for further improvement. One approach is the development of a hybrid transmission system, in which code and pattern transmission systems are mixed. It is more economical to use codes for characters of high frequency by adding a pattern generator of a manageable size at a user terminal. The development of technology associated with semiconductor integrated circuits will enable the realization of a hybrid transmission system in the near future at a reasonable cost.

The following methods are under consideration to display images transmitted by a mixed system.

(1) A code is fixed at the head of a transmission packet to indicate whether the information is coded or patterned. Information is transmitted in sub-blocks or blocks and displayed in the character-by-character method.

(2) A row containing pattern information is partly or totally compressed and transmitted by the pattern information transmission packet, and displayed in the line-by-line method. A row consisting of only coded information is transmitted in coded information transmission packets.

(3) After pattern information is compressed, transmitted and displayed in the line-by-line method, coded information is transmitted to be superimposed on the pattern information.

Technique (3) has been already put to practical use in the transmission of information from the information input terminal to be stored at the image information file, and also in transmission to user terminals of information superimposed by the image converter.

The most favorable method of the three depends upon the characters of the image, and hence cannot be determined easily. Therefore, the Nippon Telegraph and Telephone Public Corporation is now collecting statistics in order to judge best overall approach.

10.2 Diversification of Coloring Function

Another area for development is coloring. The CAPTAIN system can use only two types of colors (a designated color and a background color) for a sub-block, which is acceptable in the display of character. However, in the display of freely composed patterns such as a map, it is necessary to designate two, or more colors for a sub-block, in order to parcel out by colors the pattern in a sub-block into divisions. The following approach is being considered for the transmission of pattern information with two designated colors for a sub-block.

When two colors are designated, pattern information is reduced into one-dimensional run-length codes for three runs those without brightness, with first designated color and with second designated color. These runs are transmitted in the sequence described above and are decoded for display.

10.3 Information Input at User Terminals

A Katakana (the square form of the Japanese syllabary) keyboard on a user

terminal allows the following services.
(1) High efficiency information retrieval is allowed, since the system allows not only direct input of frame numbers and indices displayed on the screen, but input of key words and arithmetic expressions to search for requested information. This is also expected to find applications in home education.
(2) Message exchange is supported between user terminals using image conversion center files for a mail box. This may act not only as a means of communication between persons when telephone contact fails, but as a cheap way to supply relatively large numbers of people with information on meetings, entertainments, and so forth.
(3) The fast and easy input of a wide variety of information is permitted since image information can be directly input by furnishing an editing function of information from user terminals to the functions of the image conversion center. In information input, terminal displays are used for monitoring and the information input at user terminals is edited in the image conversion center into frames including Chinese characters to be displayed at terminals.

10.4 Hard Copy Unit

A hard copy unit allows storage of information which frequently changes and recording of displayed information. Hard copies are easily made by outputting and recording the contents of the pattern memory at the user terminal. The addition of a hard copy unit and automatic message receiving function enhances the above mentioned message exchange functions.

10.5 Voice Functions

A voice generator in a user terminal allows portions of messages displayed on the header to be transmitted using voice.

A service using both images and voice is also available. To transmit image and voice information over telephone circuit, the efficient method is the coded transmission of parameters related to numbers that designate syllables to be generated, volume and syllable length, with a voice generator for sentences, words and syllables installed in user terminals. This method is expected to realize voice services without largely reducing the transmission speed of image information.

10.6 Display Signals Another Call from the Same Telephone Circuit while a User Terminal is Busy.

When another call is being made with the CAPTAIN service, the circuit can be used to display a signal on the user terminal's screen. Users can temporarily retain the CAPTAIN services, as with an ordinary call waiting service, while answering the new call.

10.7 Public Terminals

A CAPTAIN terminal service will be available with a public telephone service, in public places, activated by entry of coins.

11. Conclusion

The Nippon Telegraph and Telephone Public Corporation is now conducting experimental trials of the CAPTAIN system in order to confirm system consistency and performance of functions as well as to determine problems and the characteristics of this new mass communications medium. Expansion of the system functions is concurrently being studied for future commercialization.

Conception of CAPTAIN System–Background, Experiment and Future Plans

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1. INTRODUCTION

In the throes of the new forces born out of the recent socio-economic advances and technological progress, Japan is placing emphasis on the future role of communications, which have now attained maturity, and is endeavoring to map out new policies. Especially, Japan is interested in the future development of communications policies related to new communications media using new technologies in the fields of electronics, satellite communications, and so on.

Japan, small in area and lacking in natural resources, has attained its present prosperity by making efficient use of its abundant manpower and high level of knowledge. In order to maintain its prosperity in the future and to contribute internationally, there is a need to overcome the lack of familiarity with organizing and utilizing information, and to endeavor to push forward activities based on knowledge to a higher level.

In particular, in order to promote the active use of information, it is expected that various data bases will be utilized, which may be considered to be a crystallization of new knowledge systems in an information society. The online service of these data bases in an important subject for future study.

In addition, while developing new technologies, efforts should be made to return their benefits to the people by implementing high-level, economical systems.

CAPTAIN System is a defined national data bank system reflecting these communications policies.

2. BACKGROUND TO THE DEVELOPMENT

More than ten years has passed since Japan began to change its orientation from that of an industrial society to that of an information society. During this time, the business world is undergoing a big alteration against the background of the rapid development of those technologies concerned with telecommunications, data processing and electronics. The availability of information has also greatly changed, compared with the previous age, because of the advance to a higher level and diversification of such information media as TV broadcasting, newspapers and publications.

In Japan in recent years, the demand for one-way mass media information has peaked, while those of personal telecommunications media such as telephone, data communications and others, characterized by two-way communications, has been rising rapidly. This suggests that Japanese society is shifting to a higher stage of information society in which priority is given to the need for more detailed information conforming to individual demand, rather than large-quantity copied information.

The existing information media, when considered from these viewpoints, appear unable to sufficiently provide individual information that will meet individual needs at any time, at any place, to everyone and at low cost.

As such a media to meet individual information needs, the telephone information service should be mentioned. After making its appearance in 1969, the number of programs and circuits for this service increased sharply.

However, the service cannot necessarily satisfy the demand for highly advanced and diversified information, because it carries audio information only and is limited by the small number of channels, programs, etc.

Because the audio information service alone cannot meet the needs for varied individual information by itself, studies and experiments on visual communications system have been progressing.

As a system using TV broadcasting waves, fields tests for research and development of TELETEXT have been under way since the Autum of 1978. For a wired system, the experiment on CCIS (Coaxial Cable Information System) was carried out at Tama New Town in Tokyo under the guidance of the Ministry of Posts and Telecommunications (MPT). This CCIS utilizes CATV and has offered several kinds of information services, such as facsimile-type "memo copies", "facsimile newspapers", a still picture request service, a flash information service, and others. The experiment was considered a great success.

In order to make full use of the results of the experiment, MPT has begun a second-stage experiment on CCIS, which provides such new services as "home printers" (dot printer memo copy).

However, to distribute this CCIS, a coaxial cable must be newly installed. Because of the high construction costs for the cable and other problems, it will be difficult to expand this system nationwide under the present economic circumstance.

CAPTAIN System owes its debut to the results of our efforts to pursue the feasibility of a new service available to all people, whose information needs are up-graded and increasingly diverse in an advanced information-society, based nationwide upon our experience in studies and experiments on visual communications systems.

This system was developed in consideration of the following four factors;

(i) A telephone service has spread throughout the nation, and now serves 36 million subscribers (more than 85% of all Japanese homes have telephone).

(ii) More than 90% of all Japanese homes have TV sets (color TV sets account for 90% of the total).

(iii) Central information storage techniques have advanced rapidly due to enlarged capacity and enhanced spead of memory file functions.

(iv) Cheaper terminals can be expected with the decreasing cost of ICs and LSIs.

The first two factors indicate that the system can be made available to almost everyone by utilizing the existing public telephone networks and TV sets. The last two factors indicate that a low-cost service is possible thanks to technological progress. For these reasons, CAPTAIN System is the most suitable system at the present time to provide low-cost individual information to anyone at any time and any place.

3. OUTLINE OF THE EXPERIMENT

Construction of CAPTAIN System is technologically possible, and its terminal equipment is expected to be manufactured at low cost. However, there is a certain limitation on our study and analysis of social needs for and of the service, contents of software to be developed and other factors, through mere desk work.

Therefore, it is very necessary to conduct research and studies on the various conditions required for the development of the system in field, not in-laboratory, through experiments which fully utilize real information.

For the above reasons, MPT decided to conduct, jointly with Nippon Telephone & Telegrph Public Corporation, CAPTAIN System experiment by means of experimental installations established in area of actual social activity to attain the five purposes listed below.

(i) To clarify the social needs for and of CAPTAIN System

(ii) To develop information software to satisfy the needs.

(iii) To examine the technological feasibility of center, terminal and other facilities.

(iv) To study the usability of CAPTAIN System and its various applications.

(v) To arouse social interest in CAPTAIN System

On 25th December 1979, this experiment started with 1,000 monitors in Tokyo, and a computer data-base center with an information file of about 100,000 pages was installed.

In order to promote the experimental projects, the foundation CAPTAIN System Research and Development Center (CAPTAIN Center for short) was established in February 1979, and also the Cooperative Association of CAPTAIN information providers was organized to effectively contribute information materials by 165 information providers.

4. FUTURE PLANS

In the present stage, the experiment is scheduled to continue till the end of March 1981.

A practical service is expected to begin in Tokyo following the experiment.

4.1 Practical System

It is possible to use a single adaptor for both CAPTAIN and TELETEXT systems. While TELETEXT; by one-way communication, provides quick, brief information, CAPTAIN system featuring two-way communication and retrieval services, provides detailed and selected information. Future relations between the two systems are expected to be compatible rather than competitive. Not only TV sets, but also printers for hard copy use and cassette tape recorders for information storage will be available for connection with

terminal output devices. In order to assure full conversational functions with the Center, a keyboard with the complete Japanese phonetic character set will be provided instead of merely a key-pad. In future systems, it will also be possible to provide such services as information processing, CAI, and message services, in addition to the information retrieval service.

4.2 Network Plans for CAPTAIN System

The nationwide CAPTAIN system network should be constructed to give anyone access to a wide variety of information, including local community information, at any place under the same conditions as the subscribers in Tokyo. Telephone rates for calling the center should be minimized (10 yen per 3 minutes).

It will be also possible to obtain access to other data base systems.

4.3 Legal and Rate System Aspects of Practical Use

Studies are underway to determine who should operate and manage the Centers, whether carriers or other sectors, monopolization or open competition.

The rate system of a commercial system will make an information charge and an adapter fee in addition to the standard telephone charges.

The adapter is expected to be produced for commercial use at a cost of less than ¥100,000 (appx. U.S.$500) per unit.

The information charges will be payable by users to information providers, but advertising information charges will be gratis. Collection of information charges will be carried out by NTT instead of by information providers. On the other hand, rates for use of the Center's facilities will be paid by the information providers.

4.4 Schedule for Practical Use

The target data for commencement of practical use is 1981, subsequent to completion of the experiments.

4.5 Forecast on Diffusion of CAPTAIN System

In Japan, the telephone network covers the entire country, and now serves 36 million subscribers, while TV sets are now owned by more than 90% of all households.

Thus if a low-cost services can be provided, it can be expected to spread to 90% of the total number of homes by 1990.

The Index System of the CAPTAIN System Experimental Service

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The Captain service was inaugurated on December 25, 1979 on a trial basis. This article summarizes the basic concepts of the index system for the experimental service, functions adopted in the system ideas used in construction of the information classification system of this new information medium, the Captain system, and the relation between the index system and information from information providers.

Present results were obtained shortly after system inauguration and are, therefore, tentative. A final evaluation will be issued after completion of experimental service operations.

The Index System of the Captain System Experimental Service

1. Introduction

The index system allows users to obtain the information they require conveniently and quickly.

The index system of the experimental service of the Captain system is based on an information classification system constructed mainly for household.

The index system has two forms -- one is a subject index displayed on the television screen, the other is a directory titled the Captain Information Guide.

The index system is constructed for the effective use of many functions developed for the experimental system. It has a tree structure as its base with a partly network structure. A so-called information retrieval system, which uses keyword search, a thesaurus and so on, will be introduced later based on the results of the experiments.

2. Necessity of an Index System

An index system is necessary for the following reasons:

(1) Convenience of use

Items of information must be well organized and systematically categorized to make use conveniently of the system.

(2) To suit the new information medium

The Captain system is a new information medium, and, therefore, requires a newly-compiled, index system.

(3) Compilation of information for a data bank

A new index system is necessary to allow systematic integration of individual information.

3. Captain Function Related to the Index System

3.1 Page

3.1.1 Page and Page Number

A page is the smallest information unit of retrievable information and consists of 10 frames at the maximum. Each page has a specific number of 8 digits, which is displayed at the top right of the television screen.

3.1.2 Page Number Meaning

In terms of the use, page numbers are broadly classified into the following:

1) Universal pages

Page numbers headed by O (example: 05152000) are titled universal pages. Universal pages contain contents by Information category, contents by information providers' name and so forth, which are provided by the CAPTAIN CENTER*.

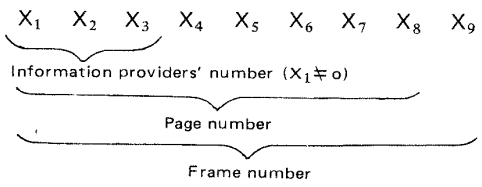
2) Information providers' pages

A page number headed by a numeral other than O is classified as an information providers' page (example: 17100600). The first three numerals mean an information provider number.

* CAPTAIN System Research and Development Center (CAPTAIN CENTER in short)

3.1.3 Frame Number

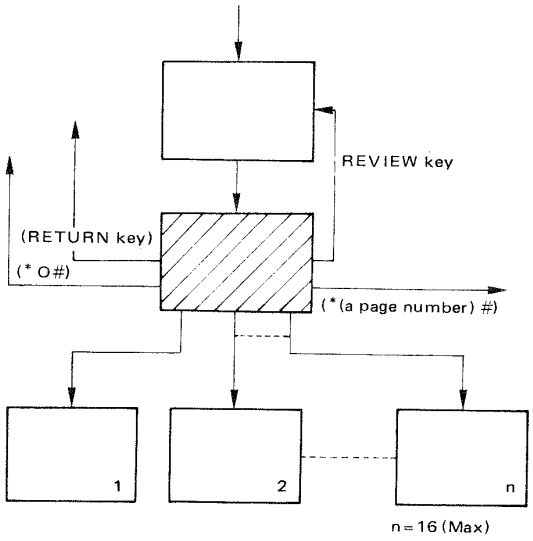
Each frame has its own number which consists of nine digits. The relations between page number, information providers' number and frame number are shown below;



Information retrieval by frame numbers is usually impossible at home user's and office user's terminals except for information providers' terminals.

3.2 Procedure for Selection of Frames to be Displayed Next

The procedure for selection of frames to follow those being displayed is shown below:



(1) Procedure for selection of frames by commands

- (a page number) # . . . . . is used to select the desired page.
- RETURN key . . . . . is used to display the frame that the user first requested from the center.
- *O# . . . . . is used to request the general index.
- REVIEW key . . . . . is used to recall the previous page.

(2) Procedure for selection of frames by choice number prepared by information providers

The desired frame is displayed by keying-in a choice number on the keypad as instructed on the screen. For this reason, an information provider prepares a selection table that collates choice number with the frame to be displayed next. Thus, a user can select up to 16 types of frames. The digit of choice number is 0 to 9.

In case that the digit of choice number is 0, a user can select the desired frame by pressing the # key only.

In frame display mode, each frame has its own selection table.

In scroll display mode, a series of scrolled frames has one.

3.3 Types of Information Required to Display a Frame

(1) Frame display mode

The following three types of information are required for each frame.

1) Frame display control information, such as a frame number, category number, display mode, background color for an image and header section, flashing color, instructions for image replacement/rewrite and display sequence of row/semirow and number of frames.

2) Information displayed on the screen.

3) Selection table, as described in Section 3.2 – (2), above.

(2) Scroll display mode

Information types described in (1) – 1) and 3) are necessary for a series of scrolled frames.

Since each frame has three types of information mentioned above, it is possible to construct freely either a tree structure or a network structure.

3.4 Information Retrieval by Page Number

A page can be directly selected by pressing the *key, a page number, then the # key. In this case, it is not always necessary to specify all eight digits; for trailing 0s are assumed of not specified in a page number. However, at least first three digits must be specified.

Example: If a page number is 12000000, entry of either:

* 12000000#
* 1200#
or
* 120#

} is correct. But

* 12# is not correct.

4. Procedure for Retrieval of Required Information

Procedures for retrieval of required information are broadly classified into two groups by system functions, as outlined in the Section 3 above.

4.1 Method Using Index Pages Displayed on the Screen

A user can select information by successively keying-in choice number of the index page on the screen.

4.2 Direct Access Method Using the Directory

A user can also select desired information by directly keying-in *, a page number, and # as explained in the Subsection 3.2 – 1). Page numbers are listed in the directory distributed to each user.

Procedure 4.1 and 4.2 are impossible without the construction of a satisfactory information classification system suitable to the new medium.

5. Information Classification System of the Captain System

5.1 Basic Concept of Information Classification System Compilation

The experiment has been conducted. This is the prime objective at present to develop the Captain system as a medium for home use, as can be surmised from the fact that 750 out of 1,000 monitoring units for the experiment are allocated to home monitors*. Therefore, the information classification system is constructed accordingly, taking into consideration the following points.

1) Easy handling is given first priority.
2) Information should be classified in a simplified and clear manner.
3) The classification should be flexible.
4) Information should cover as wide areas as possible.
5) Information should be as detailed as possible.

For the key objective of supplying information for home use, several aspects of the classification were studied, including classification by life stages (child, adult and elderly), by communities (individual, home, society, etc.), by living modes (sleeping, eating, house-keeping, etc.). As a result, it was found that the classification by living modes results in the least duplication of different items and gave the simplest classification system. For this reason, information is broadly classified based on living modes that were determined by referring to materials including those compiled by the statistics Bureau of the Prime Minister's Office and the public opinion survey organization of the Japan Broadcasting Corporation (NHK).

For the compilation of the information classification system, opinions of each member of the Cooperative Association of CAPTAIN Information Providers**were accepted to information classification system through more than 10 meetings, and two inquiries.

Information is categorized to take the following points into consideration:

(1) Four hierachical levels are provided for the classification; class, division, section and subsection.

(2) The category number is a four-digit numeric. Smaller numbers are alloted, in principle, to items at higher levels in the hierachy.

(3) In an attempt to prevent, as far as possible, one index from being displayed for two or more frames, number of choices, which every item at each level has, is limited in principle to a maximum of 16 choices set up in a selection table.

Table – 1 lists "Class" items and their category numbers.

The Appendix III shows a sample page from the "CAPTAIN Information Guide."

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* Refer to the Appendix I.

** Refer to the Appendix II.

Table 1. "Class" Items

"Class" items	Category number
News, and weather forecasts	0500
Public information	1000
Health, beauty culture, child bearing and child care	1500
Shopping and rentals	2000
Cooking	3000
Housing and real estate	3500
Home economics and law	4000
General knowledge for living	4500
Education, learning, and culture	5000
Sports	6000
Amusements and hobbies	6500
Travel and sight-seeing	7500
Business information	8500
Information displayed in English	9000

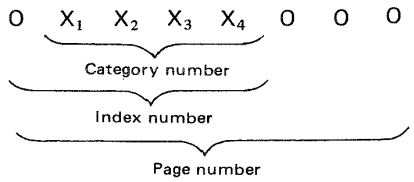
5.2 Category Numbers and Index Numbers

(1) Category numbers

A four-figured category number in the information classification system is necessary for the statistics of a utilization rating. It defines a category of information.

(2) Relations among category numbers, index numbers and page numbers.

With an index number the user may directly specify a page. The relation of these numbers is shown below:



One may press * 0, X_1, X_2, X_3, X_4 and # keys to directly call information. If X_3 and X_4 are 0, these need not be keyed-in.

6. Relation Between the Index System and Information from Information Providers

Fig. 2 shows the relation between the index system and information from information providers

These relations allow the construction of a useful data bank for users under this index system, while each information system compiled by information providers is kept independent.

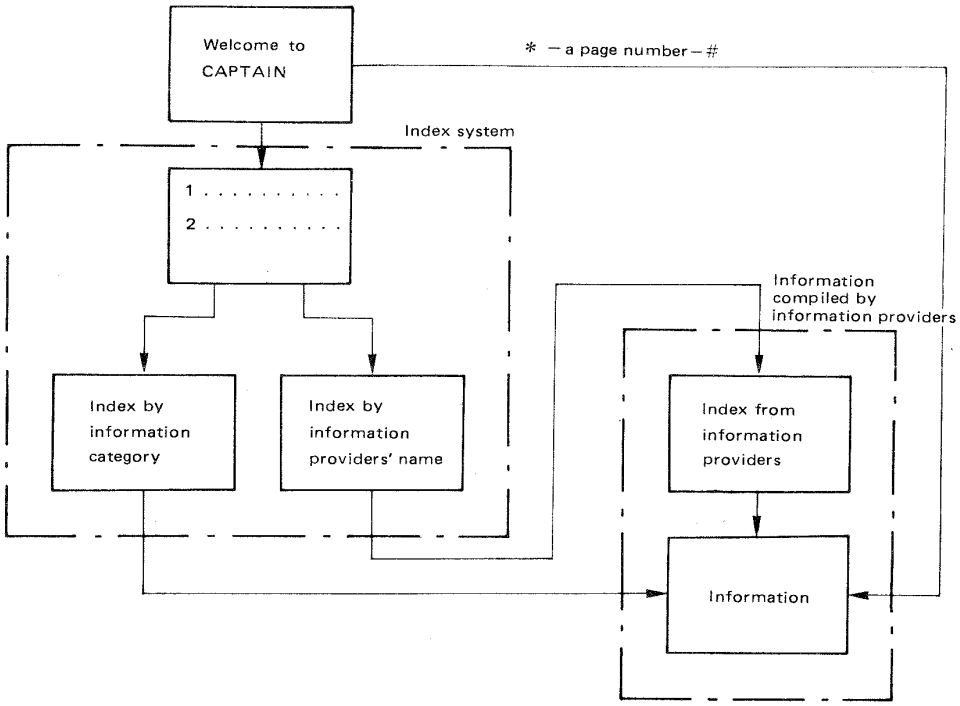


Fig. 2. Relation Between the Index System and Information from Information Providers (Basic Pattern)

7. Cross-indexing

A tree structure is the backbone of the index system, but network structures are partly introduced in order to allow the cross-indexing for the convenience of users.

8. Postscript

The index system outlined here is a preliminary ones. It will be modified as far as possible based on the opinions of both users and information providers. Studies are being continued by the Cooperative Association of CAPTAIN Information Providers to improve the index system.

9. Acknowledgement

The author(s) wish to express their appreciation for the advice and cooperation of Kashiwagi, director of the Captain System Research and Development Center, and his coworkers.

Appendix I

Monitors

1,000 monitors were selected the telephone subscribers in Tokyo metropolitan area in order to obtain thorough data of the customer's attitude towards the new videotex service and their usage patterns.

(1) Distribution of monitors

Ordinary monitors are distributed mainly in private households and privately owned small stores and chosen from a wide variety of their life styles.

Each Information Provider is, in principle, provided with a specific user terminal to check his contributing information data files prepared by the operators at the CAPTAIN Center.

Some monitors' terminals are to be installed at appropriate public places for the demonstration of the CAPTAIN service in public.

(2) Number of monitors

The number of monitors for the CAPTAIN service is 1,000 and the details of the monitors are as follows:

Ordinary households & offices	800
Public places	25
Information providers	150
CAPTAIN Center	25
Total	1,000

(3) Service area

The monitors were chosen from the telephone subscribers whose telephones are serviced by local "electronic exchanges" that are easy to add function to send out the calling subscribers' identification to the CAPTAIN system center.

The service area, at this moment, is limited to the metropolitan Tokyo area.

(4) Recruited monitors

Monitors were recruited publicly in September, 1979 from the applicants who show interest in the CAPTAIN system and offered their cooperation during the period of the experiment service.

Monitors consist of two categories; home users and office users.

The number of the monitors who participate in the experiment at home is a total of 750 and they reflect a wide variety of social attributes such as generation, age, family size, occupation and so on. Office use monitors were chosen from different fields of industry and the number of the monitors is a total of 50. The number of home use monitors is listed below classified according to the stages of life.

Newly married	30
Having infants	100
With children in early stage of education	300
With children in later stage of education	150
With post-school children	50
Old husband and wife only	20
Reserve terminals	100
Total	750

Appendix II

Information Providers

As of 25th December, 1979, 165 organizations proposed to provide information materials free of charge for the experiment. The information providers (IPS) instituted a voluntary organization, the Cooperative Association of the CAPTAIN Information Providers.

The 165 organizations are classified as follows:

Newspapers	23
Advertising agencies	22
Publishers	30
Department stores	21
Transportation & travel agencies	21
Broadcasters	8
Others, incl. bank & public utilities	40
Total	165

Appendix III

●商品知識・買い物 0213

輸入一流品百科(西武百貨店) …… 1570 019
〃 (サンケイリビング) …… 3340 01
ショッピングローン(西武百貨店) …… 1570 0185
クレジット(伊勢丹) …… 1090 0071
〃 (高島屋東京支店) …… 1690 0028
〃 (東武百貨店) …… 1860 008
〃 (松 屋) …… 2330 0071
〃 (銀座三越) …… 2360 0007
〃 (池袋三越) …… 2370 0007
〃 (玉川高島屋) …… 2420 0026

●値段調べ

生活商品お値段調べ …… 3340 0001

●ホームショッピング 0219

ミュージックアルバム特選品 …… 2140 001
趣味と実益のための特選品 …… 2140 002
カタログ販売(読売広告社) …… 2430 09
カタログ販売(西武百貨店) …… 1570 014
フジテレビ・ディノス …… 335

●売りたし買いたし(物品交換) 0223

売ります買います譲ります …… 3340 02
品物交換 …… 2440 0177
あげます …… 2440 0176

●プレゼント景品情報 0225

各種無料プレゼント(京成百貨店) …… 1250 0015
テレビ番組・プレゼントのお知らせ(テレビ朝日) … 1600 001
景品賞金の案内(東京新聞) …… 1790 026
プレゼント景品情報(東京中日スポーツ) … 1810 074
暮しのアクセサリー(景品情報) (日本リーダーズダイジェスト) 2140 003
プレゼント景品情報(図書券) (〃) 2140 0035
特別御招待会(京成百貨店) …… 1250 0011
FS得する情報 …… 3300 08

◈料理・あじ 030

●料理あれこれ 0301

料理百選(おやつ) (朝日新聞) …… 1060 033
〃 (和 風) (〃) …… 1060 036
〃 (中華風) (〃) …… 1060 039
〃 (洋 風) (〃) …… 1060 042
料理あれこれ(読売広告) …… 24301

●お料理のヒント 0303

○ごはんの料理 03031
四季のごはん料理 …… 1200 007
すぐできるどんぶりもの …… 1200 008
○おそうざいの料理 03032
卵料理 朝・昼・夜 …… 1200 012
お弁当のおかず …… 1200 002
子供のよろこぶおかず …… 1200 004
ピンチ料理集 …… 1200 014
まとめ作りの肉料理 …… 1200 016
○おいしい汁物 03033
すまし汁の具について …… 1200 011
上手なだしの取り方 …… 1200 013
毎日のおみそ汁 …… 1200 015
○食卓のヒント 03034
スパイスと料理 …… 1200 009
おもてなし料理のヒント …… 1200 003
材料別ホームフリージング …… 1200 006
マヨネーズを使ったサラダ …… 1650 001
フレンチドレッシングを使ったサラダ 1650 002
中華ドレッシングを使ったサラダ … 1650 003
和風ドレッシングを使ったサラダ … 1650 004
世界の豆料理 …… 1650 0045

●献立アラカルト 0305

今晩の献立のヒント …… 1650 006
今週の献立 …… 2440 013

●テレビ料理

テレビ料理 …… 2080 0006

●料理教室

FS催事案内 …… 3300 03

●健康と食事 0307

赤ちゃんの食事 …… 1200 021
育ち盛りの食事 …… 1200 024
妊婦の食事 …… 1200 025
肥満予防の食事 …… 1200 027
貧血の人の食事 …… 1200 029
疲労回復のための食事 …… 1200 028
美肌作りの食事 …… 1200 026
便秘の人の食事 …… 1200 03
高血圧の人の食事 …… 1200 023
胃腸病の食事 …… 1200 022

"THE COOPERATIVE ASSOCIATION OF CAPTAIN INFORMATION PROVIDERS" AND PRESENT STATE OF INFORMATION SUPPLY FOR THE EXPERIMENTAL SERVICE

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1. Introduction

In April 1978, The Ministry of Posts and Telecommunications announced the concepts of CAPTAIN System. Since then, the Ministry has asked various companies and organizations in Japan to supply information for use in the experimental service.

And some of those approached expressed willingness to participate in the service as Information Providers. "The Cooperative Association of CAPTAIN Information Providers" was subsequently organized by the information providers themselves, as a voluntary organization, under the guidance of the Ministry.

The objectives of the Association are to study means to provide information both smoothly and effectively, and to discuss problems peculiar to the provision of information for this new service.

The secretariat duties of the Association are being under taken on temporary basis by the CAPTAIN System Research and Development Center (CAPTAIN CENTER), which was set up to promote as well as to evaluate the experiment overall.

This article outlines the Association, and the present state of information supply and associated problems as seen by an information provider.

2. Organizational Structure

The Association has a total membership of 165 companies and organizations, as of January 1, 1980, covering various sectors including the press (23), publishers (30), advertisement agencies (22), department stores (21), travel agencies and carriers (21), broadcasting companies (8), and public corporations and others (40), as shown in the attached list.

Table-1 shows the organizational structure of the Association.

The Association consists of five divisions and twelve sub-divisions divided by categories of information. Information providers participate in one or more of the divisions and sub-divisions. Several representatives are nominated to manage each division and they discuss, with specifically designated experts, matters covering several divisions in the General Planning Division.

3. Activities before the Start of the Experimental Service

Information providers are studying what kinds of information (would) be acceptable and how the information should be supplied.

To streamline the activities of information providers, the General Planning Division, as well as each division and sub-division, held ten meetings before the start of the CAPTAIN experimental service on December 25, 1979 to adjust schedules and advise on construction of the information retrieval system, etc.

The main topics discussed at the ten meetings held by the General Planning Division are listed below.

1. Draft articles of the Association
2. The relation between the Captain Center and the Association
3. The Information Composition and Input Procedures Instruction Manual
4. Guideline for selection of monitors
5. Allocation of information providers' number and page number
6. Drafting tables for information index items
7. Drafting instructions and directories for the service
8. Setting up study groups
9. Research on extent of information to be supplied
10. General matters concerned with the inanguration of the service.

Table-1 Organization of the Cooperative Association of CAPTAIN Information Providers and Information Categories

Division	Sub-division	Description
General Planning		Items related to the work of the Association. Items related to over two divisions should be individually discussed for adjustment.
General domestic affairs	Household Affairs Guide	Practical Information on Living, Cooking, Home Medicine, Health, Childcare, etc.
	Guide to Shopping	Guide to Shopping for Various Goods
Education and Learning	Education	Education Programs, Guide for Schools
	Culture	Guide to Encyclopaedia, New Publications, Literature, etc.
Amusements	Travel and Sightseeing	Travel Guide,Sightseeing, Hotels, Inns, Transport Guide, etc.
	Entertainments	Guide to Radio and Television Programs, Movies, Concerts, Exhibitions, etc.
	Sports and Hobbies	Information on Leisure Activities, Sports, Gambling and Hobbies
Public Affairs	Administration and Laws	Public Information, Legal Procedures, Legal Information, etc.
	Social Affairs and Economics	Statistics, Employment Information, Vocational Trainings, Financial Information, etc.
News	General News	News, Weather Forecasts, etc.
	Special Information	Information on Market Conditions, Industry, Commerce, etc.
	English-language Information	English News, Guides in English, Learning English, etc.

The Secretariat: The Captain System Research & Development Center

4. Information Supplied

(1) Types and Amounts (number of frames) of Information supplied

Information available from the system totals 18,600 frames as of January 19, 1980. The types and amounts of information supplied are as follows. Indices: 760, News and Weather Forecasting: 750, Public Information: 1,210, Health, Beauty Culture, Childbirth and Childcare: 950, Shopping and Leasing: 960, Foods and Cooking: 1,100, Housing and Real Estate: 590, Economics and Laws (Personal Affairs): 60, Information on Household Affairs: 780, Education, Learning and Culture: 1,540, Sports: 3,350, Amusements and Hobbies: 2,470, Travel and Sightseeing: 1,790, Special Information: 1,960, English-language Information: 120, Others 210.

Of the 18,600 frames listed above, 17,900 frames are displayed in characters and the remainder in patterns. Frames to be renewed periodically total about 350; 100 are alloted to information to be renewed daily including news, 150 to such as entertainment guides and news digests to be renewed weekly, and 100 for others.

Information has continued to be supplied and input has progressed since the inauguration of the service to further enrich the information contents. As a result, it is estimated that information increased to 82,000 frames as of April in 1980, as shown in Table-2.

Table-2 Categories of Information Supplied

Category	Renewed Daily	Renewed Weekly	Renewed Monthly	Renewed Seasonally or at Longer intervals	Total
I. News and Weather Forecasts:					
(1) News	135	88	12	–	235
(2) Weekly Digest	–	90	90	–	180
(3) Events and Programs	67	192	–	–	259
(4) Outline of Persons and Personal Affairs	93	–	–	1,035	1,128
(5) Past Happenings	–	–	–	2,157	2,157
(6) Weather Forecasts	14	2	13	–	29
(7) Index	–	–	–	5,072	5,072
(Subtotal)	(309)	(372)	(115)	(8,264)	(9,060)
II. Administration and Laws	(25)	(–)	(20)	(7,578)	(7,623)
III. Education, Learning and Culture:					
(1) Educational Programs	–	–	220	3,620	3,840
(2) Publications	–	86	–	3,032	3,118
(3) Guide for Schools, Qualification	–	25	100	3,230	3,355
(4) Exhibitions and Seminars	30	85	486	–	601
(5) Educational Counselling, Education by Correspondence	–	–	12	90	102
(Subtotal)	(30)	(196)	(818)	(9,972)	(11,016)

IV. Health, Childcare and Cooking:					
(1) Childcare	–	–	–	1,320	1,320
(2) Foods and Cooking	–	30	–	6,414	6,444
(Subtotal)	(–)	(30)	(–)	(7,734)	(7,764)
V. Sports	(2,159)	(446)	(399)	(11,271)	(14,275)
VI. Hobbies	(–)	(232)	(320)	(5,735)	(6,287)
VII. Movies, Entertainments and Concerts	(–)	(80)	(4,053)	(320)	(4,453)
VIII. Travel, Sightseeing and Traffic Media:					
(1) Domestic	–	–	1,352	3,132	4,484
(2) Overseas	–	–	334	1,067	1,401
(Subtotal)	(–)	(–)	(1,686)	(4,199)	(5,885)
IX. Shopping Guide	(–)	(563)	(110)	(–)	(673)
X. Employment Information	(–)	(1,012)	(721)	(–)	(1,733)
XI. Broadcasting	(9)	(196)	(409)	(140)	(754)
XII. Housing and Real Estate	(–)	(265)	(833)	(1,329)	(2,427)
XIII. Stocks, Economics and Statistics:					
(1) Economics	–	10	368	59	437
(2) Statistics	–	–	191	–	191
(3) Stocks and Outline of Organizations	337	47	–	1,322	1,606
(4) Market Conditions	16	–	–	–	16
(5) Bonds, Foreign Exchange and Banking	122	–	–	214	336
(Subtotal)	(375)	(57)	(559)	(1,595)	(2,586)
XIV. English-language Information	(110)	(69)	(146)	(910)	(1,235)
XV. Guide to New Products and Commodities	(–)	(400)	(1,041)	(791)	(2,232)
XVI. Knowledge (Advice) on Living and Weekly Information:					
(1) Knowledge (Advice) on Living	–	–	–	2,097	2,097
(2) Weekly Information	–	1,200	50	–	1,250
(Subtotal)	(–)	(1,200)	(50)	(2,097)	(3,347)
XVII. Technical Information	(–)	(–)	(191)	(233)	(424)
Total	3,017	5,118	11,471	62,168	81,774

Note: The above figures indicate the number of frames of information.

(2) Information Supply Procedures

The Captain Center is in charge of the input of information from information providers into the computer system. Five input facilities process character information and four input facilities process pattern information (that can also

handle character information.).

Procedures for supplying information to the Center are as follows;

(i) Information providers send information in prescribed format to the Captain Center by messenger, mail or facsimile.

(ii) The Captain Center inputs the supplied information into the computer system through an input facility after checking its consistency.

(iii) Information providers check whether or not the information sent by them has been correctly input using monitor terminals installed at the Computer Center or their own offices.

(iv) Upon receiving the consent of the information providers, the Center enables the information to be used in the service.

(3) Information Charge

During the period of the experiment, information providers bear the cost of compiling and editing information for the service, and thus the information service is provided free of charge to monitors, whose only expense is the telephone charge.

5. Future of Information Supply and Problems

(1) The Association may face several problems, such as the consolidation of its organization, because it is not long since the Association was founded and it was originally organized on an experimental basis.

(2) The index and input system are under development, and should be modified based on the experience gained in the experimental service.

(3) Since this system is a new media format, studies should be made on problems that may arise in the future, such as those associated with copyright of information, self-imposed control of pornographic information, etc.

To discuss these problems positively, three study groups, with a small number of members were set up in the General Planning Division in January, 1980.

CAPTAIN System Experiment – List of Information Providers

1. Press (23)

Asahi Gakusei Shimbun-Sha
Asahi Evening News
Asahi Shimbun Publishing Company
The Fuji Evening News
Japan News Paper Publishers and Editors Association
The Japan Times
Jiji Press
The Kyodo News Enterprise
Kyodo News Service
The Mainichi News Papers
The Nihon Keizai Shimbun (Japan Economic Journal)
The Nihon Kogyo Shimbun Co., Ltd. (Japan Industrial Journal)
The Nikkan Kogyo Shimbun (Industrial Daily News)
The Nikkan Sports
Nozei Press
The Sankei Company Ltd.
Sankei Living Shimbun Co., Ltd.
Sankei Shimbun Co., Ltd.
The Sankei Sports
Tokyo News Service, Ltd.
The Tokyo Chunichi Sports Shimbun
The Tokyo Shimbun
The Yomiuri Shimbun

2. Publishers (30)

Asahi Home Doctor Publisher
BRITANICA Japan, Inc.
Bungei Shunju Ltd.
Gakken Co., Ltd.
Heibonsha Ltd., Publishers
Jutaku-Shinpo-Sha, Inc.
Kaneko Shobo Co., Ltd.
Kohdansha Ltd.
Kyoritsu Shuppan Co., Ltd.
Nihon Shuppan Hanbai K.K.
Nikkei-Mcgraw-hill, Inc.
The Ohbunsha Press Ltd.
Pia Co., Ltd.
The Reader's Digest of Japan Ltd.
Rippu Shobo
The Sankei Nenkankyoku Company Ltd.
Sankei Publishing Ltd.
Shinchosha Company
Shingakusha Publishing Co., Ltd.
Shinko Publishing Company Ltd.
Shigakukan Publishing Co., Ltd.
Shueisha Publishing Co., Ltd.
Shufunotomo Co., Ltd.
Shushoku Joho Center Co., Ltd.
TBS-BRITANICA Co., Ltd.
Tokyo Shoseki Co., Ltd.
Tokyo Shuppan Hanbai Co., Ltd.
Toyo Keizai Shimposha
Yama to Keikoku Co., Ltd.
Zenon Music Company Ltd.

3. Advertisement Agencies (22)

Agriculture Consultant Center
Asahi Annual Corporation Ltd.
Asahi Kokokusha Company Ltd.
Asahi Tsushin Advertising Agency
Bunka Hoso Brains Co., Ltd.
Dai-ichi Advertising Company Ltd.
Daiko Advertising Inc.
Dentsu Advertising Agency
Fuji Sankei Ad Work
Hakuhodo Incorporated
Japan Advertising Agency's Association
Jima Dentsu Advertising Ltd.
Kokurensha Co., Ltd.
Kyodo Advertising Co., Ltd.
Kyodo Senden Avertising Agency Inc.
Mainichi Advertising Agency
Mannensha Inc.
Meitsu Advertising Ltd.
Nippo Marketing & Advertising Inc.
Racs Associates, Inc.
Sankei Advertising Co., Ltd.
Yomiko Advertising Agency

4. Department Stores (21)

The Daimaru Inc.
The Hankyu Department Stores Co., Ltd., Shinjuku Branch
The Hankyu Department Stores Co., Lted., Tokyo Ohi Branch
Isetan Co., Ltd.
Keio Department Store
Keisei Department Store
Matsuya Co., Ltd.
Matsuzakaya Co., Ltd., Ginza Store
Matsuzakaya Co., Ltd., Ueno Store
Mitsukoshi Limited, Ginza Store
Mitsukoshi Limited, Ikebukuro Store
Mitsukoshi Limited, Nihonbashi Store
Mitsukoshi Limited, Shinjuku Store
Odakyu Department Store Co., Ltd.
The Seibu Department Store Co., Ltd.
Sogo Department Store Co., Ltd.
Takashimaya Department Store
Tamagawa Takashimaya Department Store
Tobu Department Store
Tokyo Department Stores Association
Tokyu Department Store Co., Ltd.

5. Travel Agencies (17)

Asahi Agency Travel, Inc.
Asahi Shimbun Service, Inc.

Domestic Creative Tours Co., Ltd.
Hankyu Express International Co., Ltd.
Japan Association of Domestic Travel Agents
Japan Creative Tours Co., Ltd.
Japan Minshuku Association
Japan Travel Bureau
Kinki Nippon Tourist Co., Ltd.
Nippon Express Co., Ltd. Tokyo Air Service Branch
Nippon Travel Agency Co., Ltd.
Tokyo Shimbun Travel Service Co., Ltd.
TOKYO TRAVEL AGENCY Co., Ltd.
Tokyu Tourist Corporation
Travel Experts Inc.
World Tour Operators, Inc.
Yomiuri Travel Service Co., Ltd.

6. Carriers (4)

All Nippon Airways Co., Ltd.
Japan Air Lines Co., Ltd.
Japanese National Railways
Odakyu Electric Railway

7. Broadcasting Companies (8)

Asahi Broadcasting Corporation
Asahi National Broadcasting Co., Ltd.
Fuji Telecasting Co., Ltd.
NHK (the Japan Broadcasting corporation)
Nihon Shortwave Broadcasting
Nippon Television Network Corporation
Tokyo Broadcasting System, Inc.
Tokyo Channel 12 TV Co., Ltd.

8. Public Corporations (6)

Japan Public Relations Association
Japan Tobacco & Salt Public Corporation
Japan Weather Association
Kokusai Denshin Denwa Co., Ltd.
The Ministry of Posts and Telecommunications
Nippon Telegraph and Telephone Public Corporation

9. Banks (8)

Bank of Tokyo
The Dai-ichi Kangyo Bank, Ltd.
The Fuji Bank Ltd.
The Long-Term Credit Bank of Japan, Ltd.

The Mitsui Bank, Ltd.
The Nippon Credit Bank, Ltd.
The Sanwa Bank Ltd.
The Sumitomo Bank, Ltd.

10. Research, Consultant & Information Service (10)

The Cambridge Corporation
Foundation Systems Research & Development Institute of Japan Information Center K.K.
Japan Real Estate Information Center
National Consumer Information Center
Nippon Recruit Center Co., Ltd.
Policy Developing Organization Co., Ltd.
RECRUIT JINZAI JOHO Center
The Sumitomo Business Consulting Co., Ltd.
Tokyo Metropolitan Consumer's Center

11. Movie & Theater Companies (2)

Shochiku Co., Ltd.
Toho Co., Ltd.

12. Others (14)

Dial Service Co., Ltd.
Fuji Sankei Living Service Co., Ltd.
Japan Automobile Federation
Japanese Association of Museums
Japan Trim Association
NHK Service Center, Inc.
Nihon Kiin
Sanrio Co., Ltd.
Shiseido Co., Ltd.
Student Service Society Co., Ltd.
Telecommunications Science Foundation
Toppan Moore Co., Ltd.
Yakult Honsha Co., Ltd.
The Japanese Institute of Certified Public Accountants

Viewdata in the Netherlands

Viditel

P.J.G.M. Ruiten

Project Manager of the Netherlands Postal and Telecommunications Services (PTT)

The introduction of a public Viditel service in the Netherlands will be preceded by a trial which will run from August 1980 to August 1981.
This paper looks at the preparations for the trial and the way in which it will be conducted.
The author also outlines the policy of the Netherlands PTT regarding the technical aspects of Viditel as well as policy concerning its introduction and supervision.

Since 1975, the Netherlands PTT has been seriously studying the significance of Viewdata within the framework of the communication services to be provided for the Dutch community in the future.
In doing so, we have obviously also looked at the extent to which Viewdata will penetrate the market in the coming years.
The initial results of the study led in February 1978 to the PTT asking the Dutch government for permission to conduct a trial with Viewdata.
This permission was forthcoming, and an inter-Ministry steering committee was set up to supervise the trial and in particular to study the various social and legal aspects of Viewdata.
The government has asked the steering committee to submit its recommendations before January 1, 1980.
This steering committee is led by a chairman who has no ties to any of the Ministries.
The steering committee includes representatives of the Ministry of Justice, the Ministry of Home Affairs, the Ministry of Culture, Recreation and Social Work (which handles broadcasting affairs), the Ministry of Education and Science and the Department of Scientific Policy.
The PTT is also represented in the steering committee and has provided the deputy chairman and the secretary. Others represented are the Netherlands Broadcasting Corporation and the Modern Media Foundation, an umbrella organization for newspapers, magazines and book publishers. The committee will shortly present its preliminary findings to the Government.

In cooperation with a number of publishers and institutions, we presented the Viewdata system to the Dutch public in the autumn of 1978 at the Firato national electronics exhibition and the Efficiency Fair. It was announced then that preparations were being made for a trial with a public Viditel service to start in early August 1980 and run for one year.
In the meantime, around 100 information providers have come forward and they will present their data via the Dutch Viewdata system.
This information already amounts to 100,000 frames and the number is growing every day. At the start of the trial, we expect to be able to present an information file consisting of almost 150,000 frames. This information file will be supplied by an estimated 150 information providers, including some ten umbrella organizations.
The PTT has also set up an umbrella organization to cater for the smaller information providers who want to take part in the trial without having to approach a third party.
Any information provider who thinks that he has useful information for Viditel can participate in the trial. He does not have to pay a subscription charge or a rental fee

for frame space. But every information provider taking part in the trial does have the commitment to introduce at least one user for every 50 frames he reserves. The information provider can decide for himself the way in which he wishes to go about this.
In this way, we hope to ensure that there is sufficient information and a sufficient number of users to conduct a representative trial.

With 150,000 frames filled up by information providers, there will therefore be at least 3,000 users. This figure is arrived at by dividing 150,000 by 50, according to the 1-for-50 formula which I mentioned.

In addition to these 3,000 users, the PTT itself will introduce a further 300 persons who will provide reports on their findings on Viditel in return for using the system at a special low rate.
This does not leave very much room for a third category of trial users, those who simply want to make use of the Viewdata system.
We expect a maximum of 4,000 users to be able to participate in the trial. The trial is not confined to one area. The information providers and the users will be drawn from all parts of the Netherlands. This will enable us to compile statistics from the trial which are representative for the country as a whole.
There is the disadvantage that subscribers who live in the area where the computer is located, in the Hague, will pay only the local rate for use of the telephone, whereas the rest of the country will have to pay the trunk rate for the connection with the computer. To compensate for this difference, those who live outside the area of the Hague will not be charged for use of the computer during daytime, whereas a charge will be imposed on local users. The charge for using the computer has provisionally been fixed at 00 Dutch cents per minute during the daytime and 5 cents per minute in the evening and at weekends. This arrangement will apply until May 1981, which means that it will be reviewed during the trial itself.
While we are on the subject of rates, I should mention that we expect to be able to give Viditel users a subscription for 10 guilders a month.
This charge also includes the rental from the PTT of a simple modem.
This modem is therefore the property of the PTT, unlike the terminal which must be acquired privately.
The reason for having an external modem is the expectation that quite a large number of faults will be reported which are not located in PTT equipment but in the peripheral equipment, and if Viditel becomes an everyday appliance,

there is always the possibility of inferior equipment creeping on to the market. But with an external modem, it will be possible to see whether the fault is located in PTT equipment or in the peripheral equipment.
We believe that the modem will help us to draw a distinct line between the responsibilities of the PTT and those of the user. This justifies the relatively small extra investment we have to make, in our opinion. The modem is fitted with a testing circuit by means of which faults can be seen in the Viditel centre.
So if a fault is detected, it must be located in the PTT equipment and the necessary action will obviously be taken. In no fault shows at the Viditel centre, it is virtually certain that the problems are in the peripheral equipment, which often comprises more than just a TV set. The Netherlands PTT has decided not to include the supply of this peripheral equipment in its package of services. Most of this equipment is now purchased privately. However, it will be possible to rent colour office terminals from the PTT on a contract basis.
An expansion of our product range for the business market, to include items such as printers, is currently under consideration.
I would also like to tell you something about the computer while on the subject of hardware.
A Viditel computer, a GEC 4082, will go into service on March 31 next. The computer has been duplicated to offer a greater guarantee for the smooth running of the Viditel service. When the trial starts, 192 gates will provide access to the computer on area code 070, for the Hague, followed by subscriber number 15 15 15.
During the trial, we will limit our activities to data retrieval and response facilities. For the time being, we will not use the message service or the more extensive processing function.
The PTT can offer information providers who have software stored in their own computer the software required to process their data for inclusion in the Viditel computer. This software, called PREVIEW, was acquired from the Langton software house in London and is used by the PTT under licence.

In cooperation with the Netherlands Libraries and Reading Matter Centre, an umbrella organization for most of the public libraries in the country, and the Netherlands Foundation for the Promotion of Information Supply, a structure has been designed which enables users to search systematically for information. This search structure will be controlled and kept up to date by the PTT. A test has

shown that this structure can be used quite easily by the Dutch subscriber, although some minor changes still have to be made.
Apart from this systematic search structure, information can be retrieved from the Viditel database according to keyword and the name of the information provider.
In the coming months, 10,000 copies of a provisional Viditel directory will be published, and three more updated versions will be published during the trial.
This directory is to be published by the PTT in cooperation with the Publimedia publishing house, and apart from advertising it will contain a news section, instructions for the use of the directory, keyword index and a combination of keywords and information providers.
As the first users of Viditel will not be fully conversant with the system, we expect the directory to be used a great deal.

In April 1979, the poll was conducted among 569 families and 2,052 companies and institutions throughout the Netherlands into the information needs of trial users. This poll was conducted on behalf of the PTT by two independent market research bureaus. Although this poll was too broad to make a responsible judgement regarding the appreciation of Viditel information, it nevertheless indicated that the Dutch public has a positive opinion of Viditel.
Plans for the trial are now being finalized.

A plan has been worked out with the information providers who have so far come forward whereby users have three ways of stating their views on Viditel.
Firstly, users will be asked to keep a diary for certain periods during the trial year, in which they outline their experiences with the system.
Secondly, polls will be held among the users throughout the year.
And thirdly, the PTT will follow on a computer the way in which Viditel is used by some 300 users who were specially asked to participate in the trial. These users represent a cross-section of the Dutch population.
The statistics which they provide will obviously be treated confidentially.
It is from this last category of users that most of the statistics will be obtained. Of particular interest will be their search habits, the time of day they consult Viditel, how long they stay in contact with the computer, the amount of traffic they generate and the number of times they find or fail to find the information they require.
The statistics will be processed so that appropriate decisions can be made at the end of the trial.

In anticipation of these decisions, a study group is taking a close look at the Viditel infra-structure in the Netherlands in order to prepare for the expansion of the system if the trial indicates this is justified.
As you may have learned from articles in the Press, the Netherlands PTT has decided to give its Viewdata system a face of its own by naming it Viditel.
Right from the start, there was a great deal of interest in closed user groups. We therefore decided to launch a service for closed users groups and this went into operation in June 1979, a kind of forerunner to the public trial which starts next August.
A dozen closed groups are now working on a small-scale computer system, which will shortly be taken over by the large computer.
A large number of prospective customers are currently studying the possible use of a closed user group system.
In anticipation of the results of the trial, we already know that the hardware manufacturers will be the main bottleneck in the further development of Viditel. At present there is a shortage of computer systems which can handle a large number of gates within a reasonble access time, and which also have search methods which can be used by Mr. Average.
I am also firmly convinced that the peripheral equipment, the TV terminal, is still too expensive for it to become popular, although it is true that full agreement has not yet been reached at an international level on all specifications and interfaces.
Nevertheless, we expect much of Viditel in the Netherlands, and the present concept is only the beginning of a development which is incalculable as far as techniques and software are concerned.

TELSET, the Finnish Viewdata System

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M.Sc.
Oy Softplan Ab

P Jaakola
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Finland

Finnish background

Telecommunication services in Finland are split between the Post Office and 61 independent co-operative companies.

The Post Office handles all trunk and international traffic in the more sparsely populated areas. The total number of telephones is about 2 million of which 75 % belongs to the independent companies. Since last year the whole network has been fully automatized.

On the television side there are two broadcast companies: the state-owned YLE and the commercial TV company MTV. They use the same two channels which are split so that YLE has about 79 h/week and MTV about 18 h/week. In Helsinki there is also a private cable television company, HTV, which serves about 50,000 households. Programmes in the cable are transmitted on six channels: YLE's programmes on two channels, the transmissions from Estonia (Tallinn) on one channel and HTV's own programmes on three channels.

On one channel HTV broadcasts text advertisements and pop music. The transmission is like a normal TV. It is not digitally coded and therefore needs the whole TV channel. The spectator cannot choose his pages as he can

in teletext system. YLE entered on an experimental teletext system at the beginning of 1977 and they have planned to begin the public service in 1981.

Telset project

In 1976 three Finnish companies decided to make preliminary studies of the Viewdata system. For private companies this was possible because a parliamentary committee had in 1972 stated that the electronic distribution of newspapers is not broadcasting. The companies were: Sanoma Publishing Company, the biggest newspaper publisher in Finland, Helsinki Telephone Company, the biggest independent telephone company and Nokia Electronics, the biggest electronics company in Finland. As a result the first model of Telset system was demonstrated to the public in March 1977.

At the end of 1977 these three companies established the Telset Project that started a formal trial on the 19th of June 1978. The aim of the project was to develop a Prestel-compatible system.

Experiences gained have been so promising that the participants of the project established a new company for keeping up the computer network needed for a public Viewdata service.

Public Telset service

The company will start the public service in the Helsinki area in the near future. Similarly to the Prestel system Telset service is open to all information providers. The new company will act as a common carrier and will not provide any information in the system.

At present the Telset service consists of about 10,000 frames which are concentrated for business use. Each information provider is responsible for his own database.

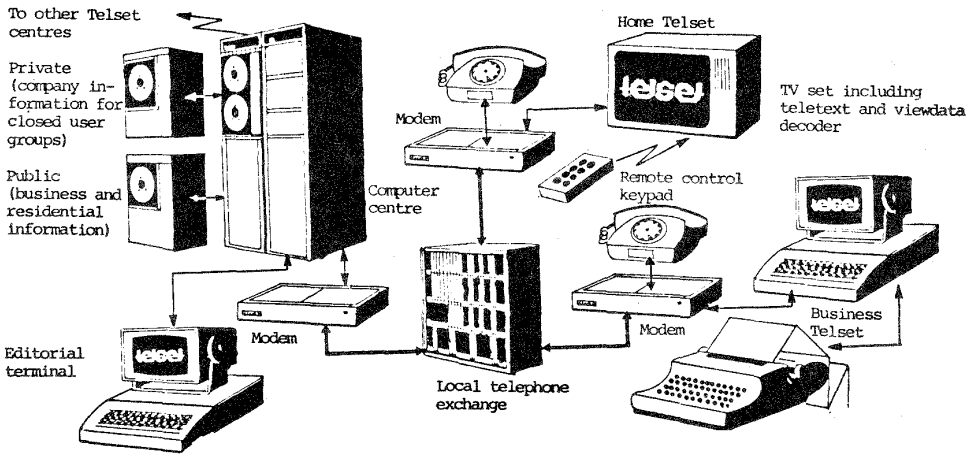
Telset technical design

The software is developed by Oy Softplan Ab, a major Finnish software house, to suit both the public system and in-house business systems.

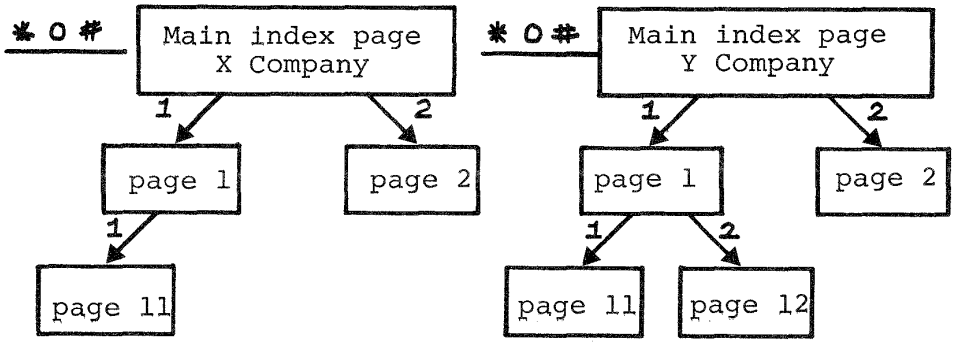
Telset is using a general computer system, running under a standard operating system. The computer may, depending on the Telset load, serve other activities at the same time. The main components of the system are:

- a computer which stores and retrieves the information
- the data base maintained in the computer
- a public switched network connection
- a modified TV receiver equipped with a keypad
- a special display terminal for data providers and business users

These components are co-operating under control of the Telset software and additional service routines residing in the computer.



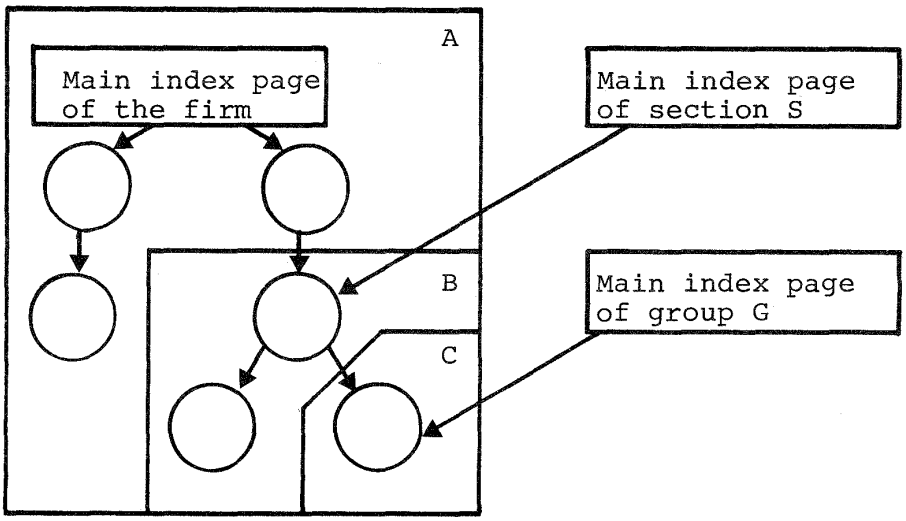
The Telset database can be divided into separate closed areas to maintain and access information for restricted groups of users. Every closed area has its secret code that can be changed at will from a users terminal. The page



The closed areas of the companies X and Y

selections are based on a private pagination for each closed area. This means short page numbers. At the same time the users are unaware of each other and each others information in the data base.

The organization of an enterprise can be interpreted by a hierarchy of closed areas. Every unit has its own area, but the areas are overlapping.



Closed area A: the information concerning the entire firm is available.

Closed area B: the information concerning section S of the firm can be retrieved.

Closed area C: only the information concerning group G of section S are visible to the user.

Telset offers features as

- extensive data base
- immediate access to the information
- swiftness and independence from traditional communication channels (mail, messenger service etc.)
- to put the desired information into practise directly

Utilizing these properties the manager directly obtains information to base his decisions on. The management may immediately retrieve information regarding e.g.

- the profitableness of the sections or production units
- the structure of the company's orderbook
- personnel resources
- the distribution of the shares
- sales predictions

depending on the extensiveness of the system. The in-house information service system is easily extended by inclusion of new service programs. The service programs can be connected to any page of the data base. The entering of data can take place by the use of a standard service program. In this area an intense development is currently in progress.

The in-house business videotex systems are marketed under the name MISTEL, which is completely Telset-compatible.

Since the beginning of the year 1980 a system to access and input hierarchically structured reports is in use. In the pilot trial there are three organization levels. The rights to access the data base are defined for each level separately so that the user on the top level can access information on all levels but the users on the bottom level cannot access the upper levels. The accumulation of information takes place upwards in the hierarchy. The data that is entered affects usually several reports which are automatically updated. There may also be calculation rules specified in connection with the data.

The Telset software is capable of serving one hundred simultaneous users on a single minicomputer. The number of editor's terminals may be up to ten. When taking into use specially designed front-end processors to perform the editing functions up to thirty editor's terminals can be connected.

The user determines fully what takes place in the system. By issuing commands the user controls the function of the system. The commands are relayed to the appropriate processes that having fulfilled the given mission transmit the retrieved information to the users terminal.

When the Telset system is distributed among several computers the required information may automatically be brought from another computer.

The processes of the Telset system are running independently on demand. Because a significant task is to transmit text frames to users' terminals, the transmission must be as efficient as possible. Telset uses a communications processor with direct memory access capability, which reduces significantly the interrupt load of the central processing unit.

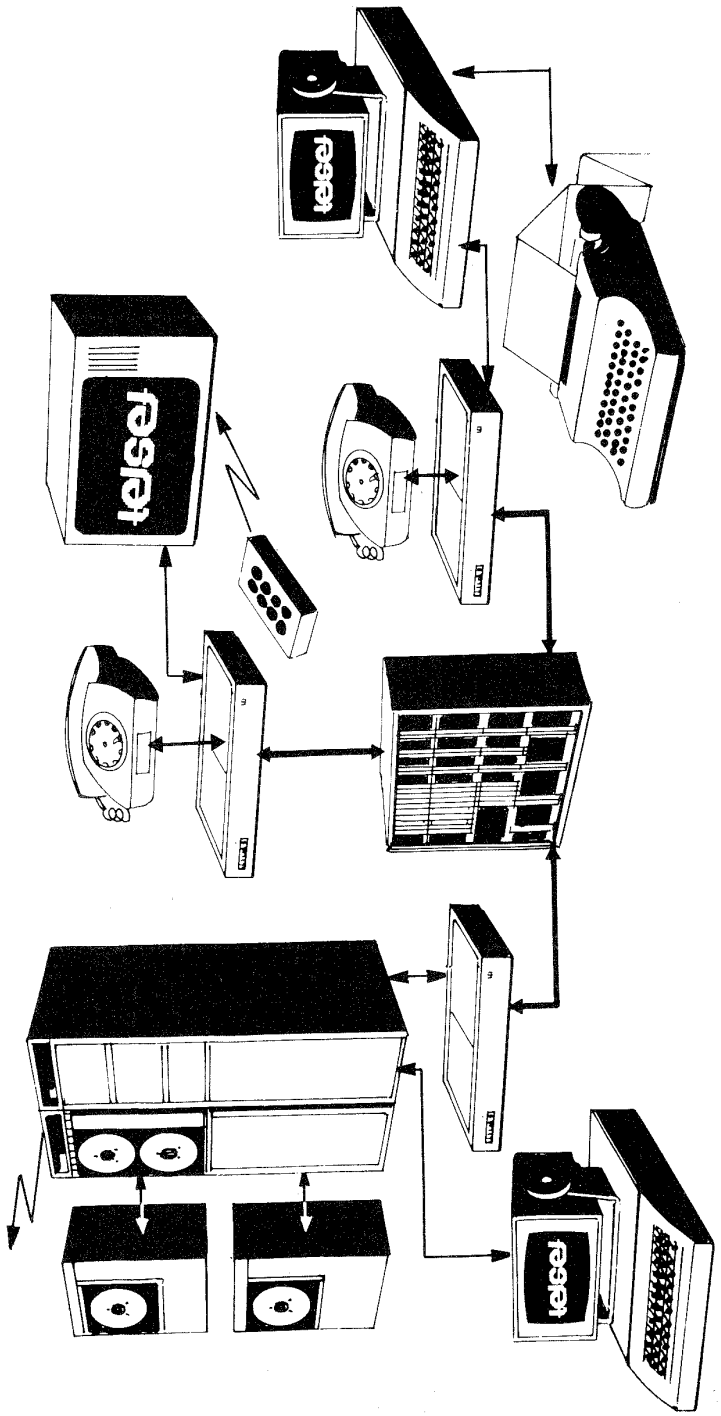
The main processes of the Telset system are

- terminal input/output and command relaying
- page selection obeying the viewdata commands
- message switching
- user identification
- logging onto disk or magnetic tape

There is a need for two different kinds of information networks: the nowadays usual kind which handles data in machine readable format and another of the viewdata type where human readable frames of text are transmitted. The in-house MISTEL system provides a link between the terminal and the information network that has the capability to combine data obtained from an information network with data from the company data base. Thus the company's figures can be shown in relation to the figures of e.g. the official statistics. It is of course also possible to recieve viewdata frames from the public network into the in-house MISTEL system.

The growth of the viewdata systems depends on the policy decisions on the national level, on the costs of the systems and on agreements upon standards. It is important that all European countries have a common technical standard, not only so an exchange of information can take place, but so sufficient volumes of equipment can be produced to ensure a sufficiently low cost system.

As mentioned earlier, the Finnish legislation permits private initiative in this field. Thus Finland is the only European country to have a public videotex service as a private enterprise. The private basis makes it possible to move fast. On the other hand, when moving fast with many interest groups, we can make solutions incompatible with other systems. Therefore we are very interested in getting the international videotex-standard.



INTERNATIONAL BUSINESS APPLICATIONS OF VIEWDATA

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Since late 1978 the author has been working on the planning of a possible international viewdata service. A critical component has been the identification and assessment of profitable business applications of viewdata, and specifically of Prestel. The paper will concentrate on business, and not domestic, uses of the technology.

Whilst viewdata readily generates an attractive and interesting image with the new viewer, it has proved difficult to characterise its precise significance to the user. This paper will attempt to compare and contrast its features with established information retrieval and dissemination service, and suggest where the market opportunities may lie.

A brief review will be made of some of the operating characteristics of international businesses. From this a set of criteria will be drawn up for identifying applications which may profitably benefit from viewdata. The paper will cite examples from a range of industries of implemented or planned uses of such a system.

1. INTRODUCTION

This paper reviews the suitability of viewdata services to handle the operational information systems of international businesses. Since, even at this early stage, there are many conceptual differences between emerging viewdata products, the paper is based on the features currently represented in Prestel.

Demonstration of a viewdata terminal normally makes a very positive impact on the person seeing it for the first time. He is impressed by the attractive presentation on the screen, breadth of information accessible and ease of use. But the real value to the businessman lies in the wide range of services which could be made available through this medium. If you asked a sample of people involved with viewdata to define its prime application, you would get a varied set of responses - electronic publishing, information retrieval, data collection, transaction systems, and so on. The range of these answers reflects the versatility of viewdata which is its great strength.

To examine the value of viewdata to international business operations, we will address ourselves to two main issues:

First - how significant is external and internal information in business management and control?

Second- how does viewdata compare with a range of established information services?

We will also illustrate with examples the possible viewdata applications in the sphere of international business.

2. THE GROWING DEMAND FOR INFORMATION

Most industries and professions, as well as many government departments, find themselves operating in an increasingly fast moving, competitive and international environment. These fast and fundamental changes inevitably complicate the task of business planning and control. The view that successful operations depends on the availability of timely, accurate and relevant information has probably always been with us, but in the last 20 years our standards and expectations of what is timely, accurate and relevant have increased considerably, due to the extent to which information needs to be relied upon in business management. For example, the insurance industry now spends between 3 and 4 billion US$ per year on buying information (equivalent to 1-1½% of turnover).

All the signs indicate that the 1980's will see the real explosion in the information services industry. It is estimated that the market for computerised information services will at least double between now and 1982.

For example, the number of bibliographic searches in Western Europe is estimated to increase from 300,000 in 1977 to between 1.2 and 1.5 million in 1982. In terms of revenue from online information centres and database producers, the European market is likely to grow from an estimated £1.5 to 3 million in 1977 to a total of £15 million in 1982.

Thus, business no longer regards information as a desirable but low priority luxury. Instead, it has become a fundamental and constant need for most organisations. It will become more so in the 80's and 90's and Viewdata will make a key contribution in satisfying this demand.

3. THE MARKET POSITION OF VIEWDATA

3.1 Characteristics

From the standpoint of the user, the main feature of viewdata technology, as represented by Prestel, is its ability to support both retrieval and distribution of specified information in the database. The information may be either accessible to all users or,through the Closed User Group facility, restricted to specified terminal/password combinations. The terminal user may, through straightforward index structures, retrieve specific frames from within large volumes of stored information, and input responses to the system.

Perhaps the most important features of viewdata, however, are its relatively low cost and ease of use, both conscious design criteria. In discussions about viewdata it is noticeable that its appeal is much greater to potential business users than to DP professionals. The latter find it unsophisticated and want to add facilities like processing and keyword search. Of course, such changes are possible, but potentially they would threaten its effectiveness in the applications for which it was designed. Since we don't yet know how to benefit fully from the functions already provided, it would surely be folly to introduce fundamental change at this stage.

The versatile features of the technology allow viewdata to be considered against a range of current information services, covering:

- information retrieval
- transaction - oriented applications
- information transmission

Each of these areas is considered below.

3.2 Information Retrieval

Automated information retrieval services in operation today typically support access to bibliographic databases (eg British Library BLAISE) or data banks (eg the Information Bank). In both cases the information on a particular topic is extremely deep and comprehensive, and sophisticated key-word search mechanisms are used. Such systems are typically oriented to use by the research specialist, fully familiar with the subject under investigation.

In contrast, the facilities and application of viewdata are suited to use by businessmen in a wide range of operational situations. The contents of the database will be broad in topic coverage, with typically less detail than required by the researcher.

Direct cost comparisons are difficult to assess accurately since both media have specific uses, but a bibliographic service would possibly cost between 2 and 8 times as much as Prestel UK for a typical general information search.

The two types of service therefore tend to be complementary: traditional data bases well suited to detailed research, and viewdata to business operations.

3.3 Transaction-Oriented Applications

Transaction-based application services are most commonly used through time-sharing bureaux or industry-oriented information systems. In the former case a specific business problem may be handled either by specially written programmes or a standard packaged solution.

By taking advantage of the Closed User Group facility, there are many business applications for which viewdata is appropriate, even though its processing capability is still limited. As illustrated later, it may be used for data collection, hotel bookings, stock information, as well as administrative applications. Of course it lacks many of the powerful features of the other media, but it does have the benefits of:

- relatively cheap and fast to implement, and cheap to operate. A comparative study for a simple hotel bookings system suggested that development and operation costs for a Prestel implementation would be about one quarter of those for a time sharing bureau.

- an easy to use system, with minimal user training

- the same terminal may be used not only for one particular application, but also to access other facilities, such as the public database.

3.4 Information Transmission

The most widely used non-voice system for information transmission is telex, particularly popular for international traffic. As well as producing an instantaneous hard copy record with the receiver, it has the advantage for many types of application (eg financial transactions) of certainty that the message arrives at its destination.

At this stage viewdata is not a point-to-point message system, and human procedures are needed to reference messages. An editor on the system may put information for a particular terminal in a pigeon-hole within the database, but it is up to the receiver to look up the information. In the other direction, response frames may be used to send messages or pre-formatted input transactions to the database, but again the editor of that part of the database must enquire through his terminal to receive the message. Thus the transmission facilities at present are simple and dependent on off-line procedures. Nevertheless they do exist, and may be cheaper than current telex charges.

3.5 Summary

Viewdata is a versatile medium which overlaps to some extent with a number of existing information services. Its position is perhaps well represented by mapping the services considered onto the two dimensions of (1) complexity and completeness of the information source, (2) complexity of the processing or cross-indexing which can be carried out on the stored data.

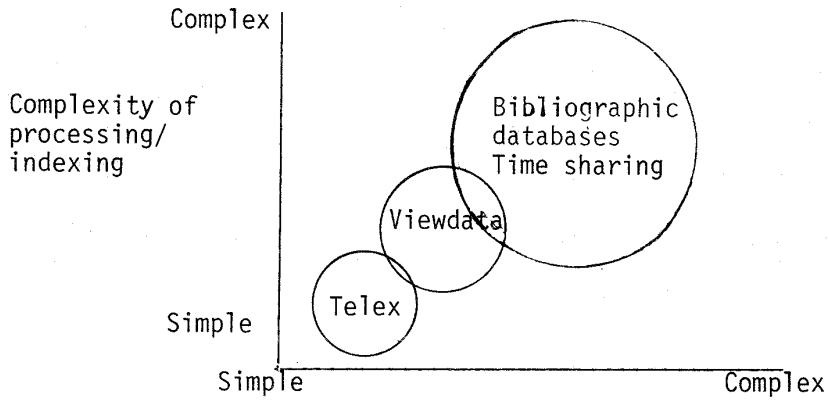

Figure 1. Complexity and detail of data

This chart suggests that, depending on the application and implementation, viewdata can occupy a position in the information services market which overlaps with communication services at one end through to information provision and processing at the other. If this analysis is accepted,and remembering viewdata's real advantages in cost and ease of use, it seems that it has a real place in the market for business services.

4. EXTERNAL AND INTERNAL INFORMATION NEEDS

The information needs of a business span both external and internal sources. On the one hand, a business needs information from publishers and other information suppliers, the quality, relevance and coverage of which are only indirectly under the control of the business. On the other hand, there is internal information, the effective flow of which is crucial for successful management of many organisations, particularly those operating internationally.

4.1 Access to external information

In Viewdata, publishers and other information providers have another medium through which they may sell their products. Their business customers will increasingly be seeking international coverage of the topics of relevance to them.

The business information supplier on Viewdata who seeks a commercial return from his investment must access and choose his target with care. It is all too easy to think of a business organisation as a single viewdata user and therefore a potential customer for all types of business information. In fact, this will rarely be the case. The justification for a viewdata terminal will usually come from an individual or department of an organisation who will pay for and control its use. It is to the information needs of these individuals or departments that the publisher must gear his product.

Therefore, if he wishes to generate, or increase, use of and demand for his information, his best plan is to orient his information to particular user types and functions or specific industry sectors. In the first case, his most likely customers will be the individuals occupying certain functions which are present in most organisations, regardless of the industry in which they operate. In the second case, his information will be of interest to individuals who all operate in the same industry sector, but they may occupy different functions within that sector.

For example, a supplier of information who specialises in the air transport field may choose to include among his Viewdata products:

- air cargo schedules and tariffs

- names and addresses of air freight forwarders

- import/export regulations

- second-hand aircraft for sale

- aircraft spare parts for sale

Of these, only the first three are likely to be of interest to distribution departments of larger organisations, but the last two will be of considerable interest to individuals operating in the air transport industry.

4.2 In-house Applications

Viewdata can be used for in-house business applications. By reserving data base space for the exclusive access of a company, national and international operating locations can access internal information systems. Thus, sales branches can find out the latest delivery status of products from other countries; company headquarters may keep outlying locations informed of the latest policies and news; order information may be collected rapidly and accurately.

The most cost effective applications to implement will obviously vary from one organisation to another, but the ease and low cost of implementation and use will often make Viewdata the right solution for administrative applications which never reach the top of the DP department's priority list.

Let us take two examples to illustrate the value of in-house viewdata services:

1) An international car rental company needs to keep track of the whereabouts of its cars, to ensure each country and city has an adequate supply. By using international viewdata services, details of all cars can be kept, including records of past and proposed journeys, availability, maintenance and insurance requirements. This information may be accessed from any operating location, and when updated, is simultaneously available to all other locations.

2) The training department of a large organisation with offices worldwide must ensure that all operating locations have access to information about centrally held training courses. Without viewdata the only economical way to inform about availability of places on training courses is by letter or telex,which can often result in over-booking. By using international Viewdata services the organisation can give up-to-date information about contents and availability of the courses, and offer the facility to book courses directly from the terminal.

These are only examples from a vast range of other possible applications, but they illustrate the characteristics of applications to which Viewdata is best suited:

Firstly, location	Viewdata is suited to applications of wide geographic spread, as alternatives tend to present information less topically and more expensively.
Second, size of database	Viewdata is not really suitable for very large data files, as the indexing can be tiring and cumbersome. However, storage is relatively cheap and therefore medium sized data files are most suitable
Third, interactive requirements	As Viewdata does not offer any real time update facilities, information requiring updates up to three times daily is most suitable. The updated information is of course available simultaneously world-wide which is a considerable advantage over other alternatives
Finally, costs.	Viewdata is currently quite inexpensive for business use. Once a decision has been taken to install an application, others can be justified on a marginal basis. In one example in the author's company, personnel records are maintained on a time sharing bureau. Virtually no computer processing is involved. Although direct comparison is difficult, the time sharing bureau cost works out at £1.50 per minute. The cost on a Viewdata service priced at 3p per minute connect charge, £4 per year frame rental and £4000 joining fee would work out at 70p per minute.

The characteristics highlighted point to in-house applications involving:

- relatively short life information which is out of date in, say, one day to four weeks. For example, market intelligence, batch control, status reports.

- update information which complements existing systems. For example, recently lost credit cards, new additions to directories, fault report libraries.

- branch to branch or customer to company ordering applications not requiring instant confirmation, or where the supply is considered unlimited. For example, car ferry booking, car hire, hotel room availability, goods purchasing.

5. CONCLUSION

This paper has addressed the latent demand by businessmen for relevant information to help them plan and control their operations, particularly in an increasingly international environment. Viewdata has been shown to offer suitable facilities for a wide spectrum of potential applications, and should be widely used within the next five years.

ACKNOWLEDGEMENT

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WORKSTATIONS IN THE ELECTRONIC OFFICE

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ABSTRACT

In this paper we examine different points related to the use of Video Display Terminals (VDT) as workstations in the office of the future. These terminals tend to replace traditional slow and paper consuming typewriters. After a general introduction about office automation systems, we present the different design considerations and characteristics needed in office workstations. We then treat the problems arising from the insertion and connection of such terminals in an integral office system. Architectural and communication issues are discussed and an original "specialized virtual office terminal" is presented.

I - INTRODUCTION

We believe that today's rapid advancement of technology has a very weak influence on office working environment and procedures, especially if this is compared to the influence of new technologies on the enhancement and automation of industrial production processes.

Many people are now aware of the necessity of improving the efficiency of office production and, at the same time, decreasing the office expenses which continue growing.

In fact, a major portion of office work is repetitive routine work such as typing repetitive letters or selecting and combining a number of standard sentences and paragraphs to form different letters, or even retyping the same text several times to include modifications and/or corrections, etc. All this repetitive work can be automated. Thus, a need was raised for automatic text manipulation machines to simplify and reduce human work in office. These machines are simply sorts of computers.

The advent of microprocessor technology enabled the realization of powerful processors at very low cost within very small boxes. Small size magnetic storage media were also developed. This encouraged the development of special individual automatic office machines capable of performing a large number of complex functions. These pioneering machines were typewriter based (such as the IBM/MTST) and performed editing operations directly on the storage media (e.g. magnetic tape), the operator having to maintain a mental image of the desired output.

Later on, Video Display Terminals (VDTs) were realized. These devices contain essentially a Cathode Ray Tube (CRT) on which the text appears, a keyboard like that of the typewriter is used to enter the text, and electronic circuits control these parts as well as the communication process between the terminal and the processor.

The extremely large market of CRTs, namely the TV market, made them available at very low prices and justified the research efforts and expenses to enhance their perfomance and qualities.

So, VDTs have got many advantages over the hard copy typewriters because they are :

1. faster
2. cheap and silent
3. they offer interactive use requirements
4. they do not use paper and therefore they substantially reduce the tremendous quantity of paper consumed by organizations

VDTs increase productivity for the following reasons:

1. the instantaneous text displaying (especially for stored texts)
2. no time will be spent loading and adjusting paper, carbons, etc.
3. corrections, insertions, deletions, etc. are much easier and faster

But, unfortunately, most of the VDTs used in offices are of the same types as those used as interactive terminals in DP centers. We think that the market of office systems and its predicted expansion justify the development and commercialization of special office VDTs. This led us to try to study the required characteristics and the design considerations of such terminals. We looked at the problem from the office automation point of view and not from that of general DP.

II - DESIGN CONSIDERATIONS FOR OFFICE TERMINALS

We have studied the requirements that must be satisfied by a helpful office system. Characteristics were defined for the two principal classes of teminals used in these systems, namely VDT and printers. We report here only those of VDT.

II-1 Physical Characteristics of the Terminal.

1. Reasonable dimensions to offer an adequate space for the user to work and put his papers, etc.
2. Quietness is necessary (well isolated transformer, no ventilation if possible, etc.)
3. High luminance because the VDT will be used in office environment where the ambient lighting is considerable
4. Very high contrast to facilitate the eye perception task
5. Multilevel, independent, typewriter-like keyboard containing all the ASCII keys.

6. Automatic keys necessitating medium finger pressure. High pressure will be tiresome while easily depressed keys may be a cause of errors.
7. A non- glaring screen.

II-2 Considerations for the Communication Interface.

1. A standard interface is necessary (EIA-RS232C or 20 mA curent loop are preferred).
2. The ASCII code is the most used one
3. Full duplex transmission facility
4. Possibility of transmission in all the following modes : character, line, message, and page. A non-protected fields transmission mode is also desirable in some applications.
5. A transmission rate higher than 1200 bauds.

II-3 Physical Characteristics of the Screen.

1. The display ideally emulates a typewriter page. Hence, a normal A4 page (8.5 x 11 inches) must be displayable, i.e. the screen will display at least 54 lines of 72 characters.
2. The raster scan video technique (TV-like) is cheaper than the vector technique. Thus every character will be formed of a matrix of illuminated and dark spots.
3. The minimum matrix size for good readability is found to be 7x9 points
4. The resolution is to be as high as possible.
5. 30 refresh cycles/second seem to be sufficient.

II-4 Display Characteristics.

1. Capital and small letters are necessary
2. It is desirable to have the facility of displaying many character fonts.
3. A means for displaying superscripts and subscripts is necessary for some scientific reports.
4. A highlighting means is necessary (high intensity, underlining, etc.)
5. The cursor must be clear : either blinking (at a small rate) or non-blinking (inverse image, etc.)
6. An alert signal is necessary (e.g. a bell ring)
7. A possibility of defining protected and non protected fields is necessary to simplify the handling of predefined forms.

The following characteristics are desirable but not very important for most applications :

8. Variable spacing between lines and between characters.
9. Variable character size
10. Proportional spacing
11. Split-screen facility to simplify communications between users
12. A possibility to define windows and their attributes (numeric only, alphabetic only, etc.)
13. The possibility of defining new character graphics.

II-5 Functions and Intelligence of the Terminal.

1. Cursor control by a simple and rapid manner
2. Read cursor coordinates
3. Elementary editing functions (e.g. character insertion and deletion, line insertion and deletion, etc.)
4. Local memory of at least one A4 page.

Some desirable but not essential features are :

5. Automatic pagination
6. Programmable function keys
7. Compacting the text displayed on the screen.
8. Search a character
9. Limited graphics facilities
10. Automatic heading insertion and display.

III - ARCHITECTURE OF AN OFFICE WORKSTATION

Almost all video display based office workstations use common VDT used in DP. The general structure of a typical microprocessor based VDT is given in Fig.1.

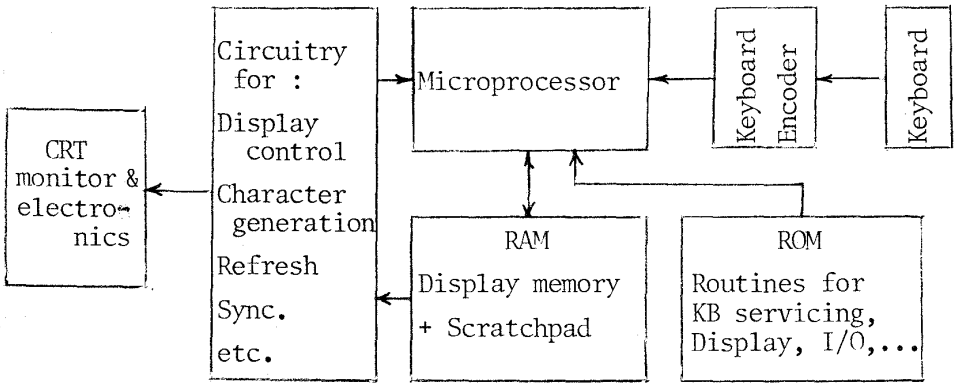


Fig.1 General Structure of a VDT

In general, office automation systems are multi-user systems to enable many users to communicate, send intramural mail and memos and use a common data base. We give in Fig.2 the general structure of such a system. It is more efficient to use a common pool of output devices but this obviously requires a somewhat complex software to allocate these units to different users.

The workstation itself needs to contain more specialized functions than those existing in common VDT. A microprocessor is therefore needed at every workstation to perform these functions and to manage the communications between the whole workstation and the rest of the system.

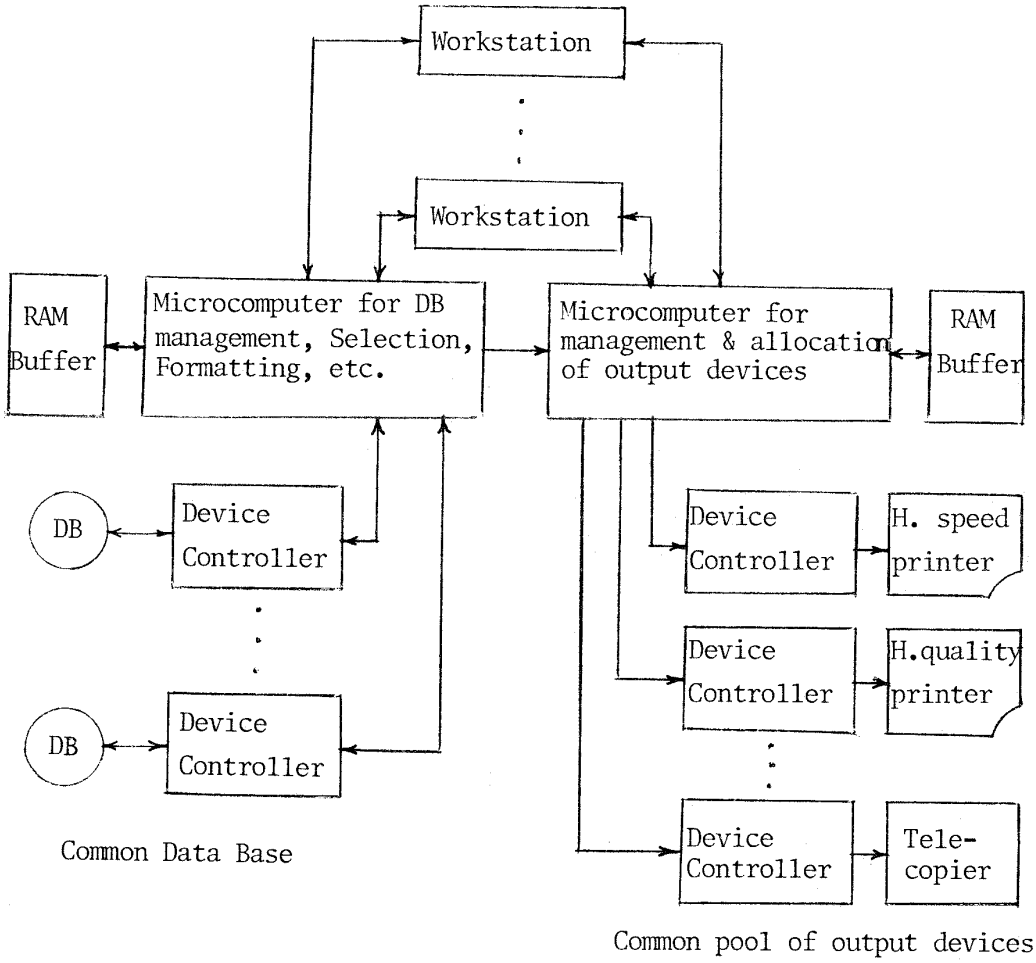


Fig.2 A Multi-user Office System

We propose two types of workstations :
1. A standalone workstation for managers or persons working with confidential data not to be transmitted through the different parts of the whole system (Fig.3).
2. An ordinary workstation for common users (Fig.4).

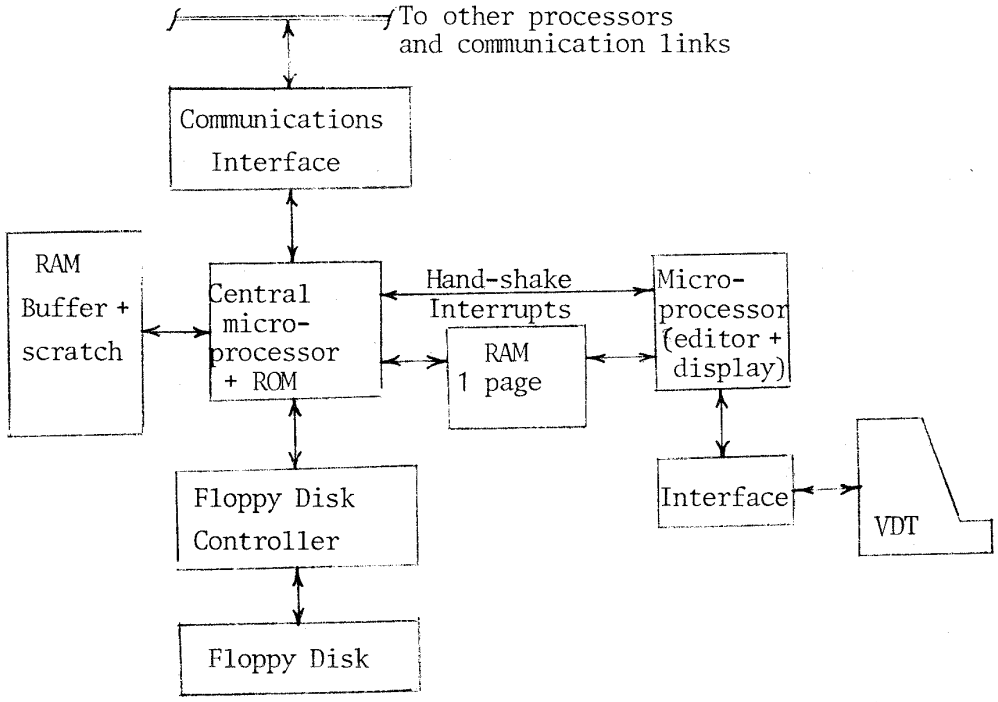


Fig.3 A Stand-alone Workstation

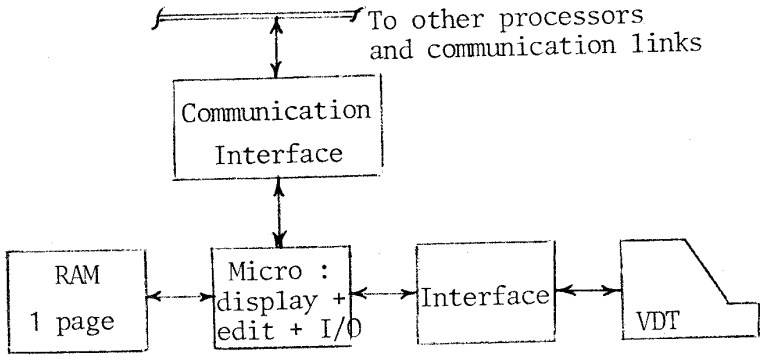


Fig.4 An Ordinary Workstation

IV - CONNECTING THE TERMINALS

Let's discuss the following classical problem. The terminals used in office systems are of different types and have different characteristics. There is no respected industry standard for both the syntax and semantics of the functions of terminals (such as delete line).

The word processing software designer will have to write an I/O handling module in his system. But, the I/O functions being different from one terminal to another, he will be forced to consider the specific functions and characteristics of the terminal to be connected to his system. This will cause problems of software portability. Any replacement of the used terminal will necessitate corresponding modifications in the I/O module of the word processing software. It is obvious that supporting many types of terminals would amount to a considerable software effort and a large software maintenance problem (1).

The solution consists of defining a "virtual terminal". This notion tends to reduce the apparent incompatibility for the terminals of the same class (e.g. VDT). This virtual terminal gives a normalized representation of the characteristic functions of a class of terminals (14).

After the definition of a virtual terminal for a certain class, only one software driver will be necessary for all types of terminals belonging to this class. However, the real terminals will need to be adapted to the system by making them similar to the defined virtual terminal. Hence, an adaptation software (with its hardware support) will be needed for every type of terminal.

One may say that we come back to the starting point : writing a driver for every new terminal. But the latter solution is more desirable than the former one because of the following considerations (1,18) :

1. The software adapter needed for a new terminal is much simpler to develop than a completely modified I/O handling module.
2. There is no software maintenance associated with the terminal adapter.
3. A microprocessor-based support for this adapter is very simple and may be cheaper than the main memory space needed to store a new I/O handling module.

4. A part of the execution of I/O functions will be transferred to this terminal adapter freeing the main processor to do other tasks and more efficiently serve the users of a multi-user system.
5. If other systems are developed to make use of the same workstations, they will also need only one software driver.

We have just shown that the notions of virtual terminal and terminal adapter are acceptable as a solution to our problem. It remains to develop the principles of defining a virtual terminal so that it minimizes the overall fixed and running costs of the system and efficiently uses the capabilities of the available hardware.

In many systems, the virtual terminal is considered to be a common typewriter. So, most programs work for many kinds of terminals because they treat each terminal as if it was a teletypewriter, expecting the operating system closest to the terminal to do any special handling for the terminal (e.g. padding). But, displays offer many more possibilities to the user than teletypewriters because they can be programmed to operate in a two dimensional way (2).

The evolution and ever increasing "intelligence" of VDTs make it inefficient to continue to use them as dumb terminals. Therefore, a more intelligent virtual terminal is to be defined.

On the other hand, a too intelligent virtual terminal may raise the problems in the reverse direction, i.e. the common not-so-intelligent terminals will not be able to adapt.

The solution is located somewhere between these two extreme cases. We propose the following one. The virtual terminal will be an intelligent one so that it can directly execute the I/O functions needed in office work. To define these functions many office automation systems have been studied and, from this experience, we were able to deduce the list of the functions needed to simplify the development of a word processing software. These functions were chosen so that they do not use display capabilities not existing in the great majority of VDTs.

In fact, we divided the office terminals into three main classes :

1. VDT (for input and output)
2. Teletypewriters (for input and output)
3. Printers (for output only)

A virtual terminal is defined for each class. To do so, we divided the I/O functions needed for office automation into three parts :

1. a part common to all terminals
2. a part concerning the management of video display units
3. a part concerning the management of printing.

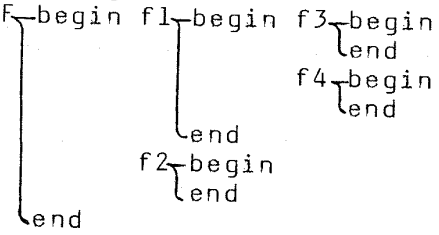
These functions constitute an I/O language for the communication between terminals and the word processing software. For lack of space, it is not possible to report in this paper the whole list of the commands of this special I/O language (about 50), but we can communicate it to interested persons individually.

It remains to discuss the manner in which this language will be interpreted and executed by the various types of terminals.

We suggest the definition of a hierarchy of I/O functions. The highest level will be the language of our virtual terminal. Every function will be analyzed into subfunctions and so on until we reach the lowest level which contains the simplest functions existing in all the terminals.

For each terminal, a certain level of this hierarchy will be directly executable by this terminal. The interpretation of the functions of the virtual terminal will consist of executing these functions by using the real terminal's functions.

To clarify this, let's consider a function F of the virtual terminal. The interpreter module for F will have the following form :



When writing the terminal adapter we'll check if F is directly executable by the terminal, i.e. if it exists in its function repertoire. If it exists, no adaptation is needed (or it may be a simple change of the code of the function). Otherwise, we'll check for f1 and f2. If they exist, the second level interpretation will be sufficient, otherwise we'll check for f3, f4 and so on.

This part of the adaptation process could probably be automated. We actually work in this direction but we still have no definite results to report.

V - CONCLUSION

The low cost and reasonably high power of microprocessors helped in giving a sort of intelligence to office machines. Video display units, information networks, and small size magnetic storage media have greatly simplified office work and substantially decreased the tremendous quantity of paper consumed by organizations.

These facts revolutionize office procedures. But up to now, very little -if any- effort was done to design office automation systems as special purpose systems and not as simple application programs using the hardware of a general purpose microcomputer. We think that the actual state of the market of office automation systems and its predicted expansion justify the construction of some devices specially designed for these systems.

The characteristics given in section II of this paper could be used as the core of the design specifications for new office workstations. A command language for these terminals is to be standardized and respected by the constructors to simplify the connection of terminals to office systems. Knowing that standardization is always a difficult and lengthy job, an intermediate solution is proposed. It consists of defining a specialized virtual office terminal. The adaptation of any real terminal to appear like the virtual one is simplified by the suggestions given in section IV.

We finally believe that a lot should be done in order to use the marriage between microprocessor and video display technologies in a more efficient manner especially in offices and administrative works.

BIBLIOGRAPHY

(1) Andrews, D.I. "Line Processor : A Device for Amplification of Display Terminal Capabilities for Text Manipulation" AFIPS Proc. of NCC 74, May 1974

(2) Andrews, D.I.; Boli, B.R. and Poggio, A.A. "An Introduction to the Frontend" SRI-ARC report No. 28743, Feb. 1977

(3) Auerbach Publishers, Inc. "Auerbach Guide to Intelligent Terminals" 1975

(4) Backler, J. "Raising CRT-Terminal IQ's" Digital Design, Vol.6, N.9, pp.39-56, Sept. 1976.

(5) Belleville, R.L. "Video Terminal Development" SRI-ARC report N.28989, Jan. 1977

(6) Belleville, R.L. "An Interactive Workstation for Knowledge Workers" SRI-ARC report No. 29004, Jan. 1977

(7) Cropper, L. "What's Ahead in CRT Terminals?" Digital Design, Vol.7, N.4, pp.36-46, Apr. 1977

(8) Dolotta, T.A. "Functional Specifications for Typewriter-like Time-sharing Terminals" ACM Comp. Surveys, Vol.2, N.1, pp.5-31, March 1970

(9) Engelbart, D.C. "Design Considerations for Knowledge Workshop Terminals" AFIPS Proc. of NCC 73, pp.221-226, June 1973

(10) Hartke, D.; Sterling, W.M. and Shemer, J.E. "Design of a Raster Display Processor for Office Applications" IEEE Trans. on Computers, Vol.C-27, N.4, pp.337-347, Apr. 1978

(11) INFOREP Association "Les Protocoles d'Appareils Virtuels dans les Reseaux Informatiques" Report No. IFR-514, Oct. 1977

(12) Irby, C.H. "Display Techniques for Interactive Text Manipulation" AFIPS Proc. NCC 74, pp.247-255, May 1974

(13) Logeman, J. and McCabe, J. "Improving CRT-Module Performance in Today's CRT Terminals" Digital Design, Vol.7, N.4, pp.50-58, Apr.1977

(14) Naffah, N. "Protocoles d'Appareils Virtuels Type Ecran" INFOREP report N. IFR-503.2, Oct. 1976

(15) Shemer, J.E. and Keddy, J.R. "The Soft Display Word Processor" Computer, Vol.12, N.12, pp.39-48, Dec. 1978

(16) Snigier, P. "Spotlight on Printers" Digital Design, Vol.8, N.9, Sept. 1978

(17) Tantawi, A.N. and Mourad, M.M. "A Modular Office Automation System" Proc. of the Fifth International Symposium on Mini and Micro Computers and their Applications, Zurich, May 1979

(18) Tantawi, A.N. and Mourad, M.M. "Solving Some Problems of Office Automation Systems" IEEE Proc. of the First International Micro and Mini Computer Conference, Nov. 1979

(19) Tantawi, A.N. and Mourad, M.M. "A Universal Modular Language and Software Core for a Flexible Office System" To appear in the Proc. of MIMI'80 Asilomar, Jan. 1980

Viewdata : A Practical Medium for Electronic Mail

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Viewdata was conceived of as a low cost two-way information retrieval system. However with limited modifications to both the viewdata terminal and transport network it could also offer a simple two-way message facility. In this way, viewdata becomes a possible candidate for supporting a limited form of electronic mail, similar to telex.

Electronic mail is often seen as a direct replacement for physical mail. Therefore viewdata would appear to have no prospects in this area. However a closer inspection of user needs suggests that there may well be a demand for message based electronic mail services which would be met adequately by a viewdata system.

Optimistic market projections for viewdata indicate a very substantial penetration of terminals into business offices. Once there, the low incremental cost of overlaying message facilities presents a powerful argument for combining viewdata and electronic mail.

The only unknown factor in this process will be the PTTs who cannot afford to accelerate the demise of telex by offering a more convenient system. However the plans to upgrade telex to a full document delivery service leave a visible gap which a viewdata electronic mail could easily fill.

1. INTRODUCTION

By chance rather than design, viewdata is likely to find itself a principal contender for the commercial electronic mail systems of the 1980s. This is not to suggest, however, that every up-to-date office manager of the 1980s will sit down at his desk each morning to open his letters on a viewdata terminal, as current thinking on electronic mail would imply.

To make a convincing case for viewdata as an electronic mail system, it will be necessary to modify the popular image of electronic mail as being a direct replacement of the physical mail service. Exploring the needs of the market more closely, it becomes apparent that the most pressing requirement for improved business communication services is in the area of desk-to-desk message communication to supplement both the telephone and telex services. It is here rather than in the area of letter and document delivery that electronic mail systems are likely to spring up first.

Viewdata becomes an attractive prospect for this form of electronic mail merely through its forecasted presence in the office.

The optimistic market projections for the growth of viewdata services amongst the European business community suggests that a sizeable number of office workers will have viewdata terminals on their desks by the mid-1980s. If the viewdata terminal does win the race to the manager's office, it will command a powerful position for capturing services other than information retrieval, such as electronic mail.

Once on the office desk, the incremental cost of adding electronic mail facilities to a viewdata terminal are small compared to that of installing a dedicated system. This has a strong appeal to the market. The inertia that exists in today's electronic mail market is closely connected with the high investment necessary to design and install such systems. Once an economical alternative appears, the market is likely to see much more rapid growth.

However compelling the reasons may be for adding electronic mail facilities to viewdata, there will be some modifications necessary to the existing system to make this happen. For example, the input and output facilities of the terminal will need to be enhanced, as well as the transmission network itself.

The principal suppliers of viewdata are the Public Telecommunication Authorities (PTTs). It will be these bodies who will decide the fate of such a possible extra service. If a simple message service on the viewdata network is in keeping with PTT plans for non voice services, it could happen. Otherwise, such message services will be at most available only on private in-house viewdata systems which are out of control of the PTTs.

2. FINDING A NEW DEFINITION FOR ELECTRONIC MAIL

The noticeable absence of electronic mail systems in Europe makes it difficult to find a convincing definition for such a service. Most systems under development are based on the view that electronic mail should be a straightforward replacement for existing physical mail services. If this is an accurate reflection of the market's requirement for new business communication systems, the limited message handling capability of viewdata would put it out of the running.

However, recent surveys of user needs indicate that the market's own assessment of its requirements may differ considerably from how the suppliers interpret the situation. In addition, a look at the short comings of today's communication systems does little to suggest that there is a priority for replacing physical mail.

In order to find a possible role for viewdata in electronic mail, we must first try to clarify what the market is looking for in this area. This will help us to find a practical definition for electronic mail.

The response of large companies to the anticipated benefits of tomorrow's communication systems adds a valuable input towards our goal of defining electronic mail. In a survey of two hundred European companies conducted by Butler Cox & Partners it was found that the factors which the market considers important when evaluating electronic mail systems were:

EVALUATING ELECTRONIC MAIL SYSTEMS - THE USER's VIEW

Factors on which to Evaluate Electronic Mail Systems	Relative weighting of factors
Increased Staff Productivity	19.6
Demand for Faster Communication	18.9
Demand for Easier Document Handling	17.4
Savings in Office Labour Costs	16.7
Savings in Communication Costs	15.5
Improved External Communications	11.9

Source: Butler Cox and Partners

Figure 2.1

The most obvious conclusion to be drawn from these results is that the market is not just looking for a cheaper way of sending conventional mail. Rather, it is looking for a new form of communication which can overcome the major deficiencies of existing systems. These deficiencies include the secretarial costs of producing written messages, and the disruptive influence of the telephone on management's time.

Another finding of the same European survey illustrates who amongst the office workers will make most use of the new system:

WHO WILL USE ELECTRONIC MAIL SYSTEMS

Category of Staff	Relative weighting of staff categories
Middle Management	19.7
Professionals and Technicians	16.8
Other Administrative Staff	16.5
Secretaries	16.3
Clerical Staff	15.6
Top Management	15.1

Source: Butler Cox and Partners

Figure 2.2

In today's office, the secretary produces the majority of postal mail, whereas the survey results suggest that in the case of electronic mail, the post is equally likely to originate and be transmitted from the manager's desk.

This will decrease the cost of sending messages and improve delivery times.

Evidence that electronic mail systems are moving closer to the source of business information i.e.: the manager, emerges from a recent survey on the systems under development in the USA. Here the market is more advanced, and already experimenting with different technologies:

DEVELOPMENT OF DIFFERENT ELECTRONIC MAIL SYSTEMS IN THE USA

System	Respondents actively developing the system:
Terminal-to-Terminal	52
Mailroom-to-Mailroom	15
Terminal-to-Mailroom	14
TOTAL SAMPLE =	81 RESPONDENTS

Source: Butler Cox and Partners

Figure 2.3

These surveys indicate that in the market itself, the most apparent need for electronic mail is amongst managers and professionals, with the emphasis being on desk-to-desk systems.

The reason for such thinking amongst users becomes obvious when we consider the short falls of today's communication services. Relative to the dramatic changes taking place in many areas of modern business, this area has remained static for decades.

One of the earliest and most popular means of communicating has been by telephone. The telephone is universally established throughout every business and enjoys the prestige of sitting on every desk from the managing director down to the office clerk. Despite its ubiquity, we all know how frustrating and disruptive the telephone can be. As many as two calls out of every three can fail to locate the called party, and the presence of a telephone on every desk can cause chaos to an organised work pattern or private meeting. The efforts of modern computerised telephone exchanges to address these problems have been meager compared to the inherent inefficencies of such a system. The telephone will remain by its very nature a disruptive device if it is to provide an immediate means of contacting somebody.

At the other end of the communications spectrum, the postal service provides a reliable but frequently slow means of conveying information. It has one advantage over the telephone in that the recipient can decide when to deal with his incoming mail. Thus the familiar ritual of opening the morning's post. However the time and cost of producing a typed letter or memo makes better communication a relatively costly and lengthy process. The written letter could become obsolete in the fast moving business of the future.

Telex was designed to overcome some of the problems existing in the mail and telephone services. It offers a rapid delivery of short messages which could substitute for either a phone call or letter. However the inconvenience of today's telex service has discouraged its serious adoption as a viable substitute for other services, except in certain special situations such as international mail.

Set against the backcloth of established systems, it is not too difficult to predict the range of features and facilities which are likely to appear in the business communication systems of the future. For example, the new systems will need to offer improved delivery times against the postal services, and yet be less disruptive than the telephone. They will also need to be much more convenient to use than telex, and offer wider character sets.

Indications from the market itself suggest that the new systems will need to penetrate into the manager's office, and therefore be simple enough for him to use. The popular image of a sophisticated letter and document delivery system would be quite unsuitable for a manager to operate, particularly when inputing information.

A system designed to handle brief messages is more likely to gain acceptance amongst management.

From these observations, we see that a new definition of an electronic mail system would need to be built around management rather than clerical or secretarial staff. It would also be of greatest value if it provided complementary facilities to the existing services such as the telephone and physical mail. We therefore propose the following definition as a useful reflection of the market's requirement:

"An electronic system which enables professional and managerial staff to originate, send and receive brief messages directly from their desks without the intervention of secretaries or other third parties".

What lies behind such a definition is that telex could have fulfilled this need years ago, and would have done so but for the inadequacy of the technology. Turning to viewdata, it is significant that of all the terminals to be found in modern businesses, only the telephone is universally present on all managers' desks at the present time. The close association between viewdata and the telephone already suggests that the prospect for offering electronic mail over the telephone network via a viewdata terminal is an attractive one. However before proceeding with our case, it is necessary to look at electronic mail systems in more detail.

3. WHERE HAVE OTHER SYSTEMS FALLEN SHORT?

The scarcity of electronic mail systems in today's market does not necessarily imply the absence of a market demand for such products but rather suggests that existing technologies are unable to meet the market need effectively.

Where, therefore, do the technologies fall short of expectation? Electronic mail systems are made up of two components: the terminal and the delivery system. To ensure that the whole system provides an effective service, each component must be carefully thought out.

Assuming that a wide range of office workers will use the electronic mail system, the terminal must be simple to use and conveniently placed in relationship to the user. If the system is primarily for inter-site communication, each company must ensure that its electronic mail terminals are compatible with each other, and preferably with other terminals outside the company.

Finally, to encourage the highest growth and fullest availability of the system, the cost of each terminal must be kept as low as possible to meet departmental budgets.

With these conditions in mind, let us examine some existing competitors for the role of an electronic mail terminal. Facsimile has long been promoted as the all-purpose desk top electronic mail terminal. It is certainly versatile, accepting both text and graphic messages. However the first generation facsimile machines never lived up to the expectations of the market, and as such, the facsimile technique has remained a 'sleeping giant'.

The facsimile terminal fails on almost every count. First generation products were almost universally incompatible. They were also slow, often taking six minutes to transmit a page, and therefore inconvenient. Copy quality was so poor as to frequently be unreadable, and no directory was available to assist in locating other facsimile users.

Subsequent generations of facsimile have gone some way towards overcoming these difficulties. However the technique is destined to be surpassed even before it reaches its full potential. Any serious predictions that facsimile would sweep away the telex service have been cast aside in the light of market experience.

Communicating work processors are another electronic mail candidate. They approach the market from a completely different angle. Most companies are rapidly acquiring word processors to improve secretarial productivity. The standalone justification will enable these terminals to become widely distributed in the office. Thereafter it may be feasible to exploit their communications capability to offer electronic mail between secretarial stations. Again problems of compatability are universal amongst current products.

The word processor generally requires the specialist skills of a secretary to be most effective, and is an unlikely candidate for a manager's desk. However it may well cater for certain classes of electronic mail in the future such as letter and document delivery. This will only happen when an effective delivery system is provided to co-ordinate communication.

A third candidate for electronic mail currently is the timeshare terminal which is gradually appearing on or near the manager and professional's desks. Here again, the computer terminal requires specialist skills for operation, and the computer network itself would need substantial modification to provide a useful message service between users.

Even if an attractive terminal can be designed, much of the responsibility for finding a successful approach rests on the delivery system. As indicated earlier, one benefit of electronic message systems over the telephone is the improved control of the user over the delivery of messages. An electronic mailbox is therefore an essential facility, enabling the sender and receiver of mail to originate and collect messages at their convenience. The delivery system must therefore incorporate store-and-forward facilities.

Cost effectiveness and speed of delivery are the other two important ingredients. The two are often interrelated, especially when electronic mail shares valuable bandwidth with other forms of communication such as the telephone or computer networks. Scheduling of electronic messages in between peak periods of voice and/or data can reduce the cost of transmission considerably.

The various delivery systems available today include the telephone and telex networks, which offer a direct connection between terminals; and computer networks, which generally provide intermediate storage and processing facilities.

Delivery systems can also be subdivided into public, or PTT-supplied, systems and private, or in-house, systems.

Public delivery systems such as the telephone and telex networks have the advantage that the PTTs control network standards and guarantee national coverage. However the sheer size of a public network with the investment it represents slows down technical innovation. Recently, the PTTs have made substantial commitments towards upgrading the telex networks to provide high speed communication, word processing and possibly electronic mailboxes. They are also introducing purpose-built data networks which will assist in the transport of electronic mail.

The most recent development in both the public and private sectors is the introduction of a viewdata service.

4. WHAT IS VIEWDATA

Viewdata is a new but startingly simple concept, linking the domestic TV to the telephone network in order to provide a 2-way system for information retrieval. The essential qualities of viewdata are its low cost, ease of use and universal applicability.

In the 1980s, when information becomes an increasingly soughtafter commodity both for businesses and consumers, viewdata is seen as the most practical means of providing mass distribution of information. As such it is almost assured of commercial success in the next few years.

The compelling long term prospects for viewdata have not, however, been sufficient to encourage most terminal suppliers to adopt mass production pricing levels. Instead, the early viewdata sets are expensive and therefore only practical for business applications.

Viewdata is therefore likely to gain most immediate acceptance in the less price-sensitive business market before prices tumble sufficiently to cater for the latent consumer demand.

The table below shows the predicted market penetration of viewdata terminals into the business and domestic markets:

SALES OF VIEWDATA TERMINALS IN EUROPE

	'79	'80	'81	'82	'83
Business Market	5	40	130	280	500
Domestic Market	5	35	90	350	650
Total Annual Sales	10	75	220	630	1150
Cumulative Sales	10	85	305	935	2085

Source: Butler Cox and Partners ('000s of terminals)

Figure 4.1

The business and commercial markets will encourage the development of quite different viewdata terminals. The business market, for example, will need a keyboard. A telex interface will also be extremely useful.

The domestic market is likely to encourage stand-alone features to be built into the viewdata terminal such as a personalised computer, and video disk.

Although electronic mail could be offered early-on in a very limited form to the domestic market, our interest here is focused on the business market.

5. THE CASE FOR A MESSAGE SERVICE OVER VIEWDATA

Having redefined electronic mail to take account of the needs of the market place, and surveyed the possible competitors in this market place, we are now better able to make a case for viewdata as a principal contender for the electronic mail systems of the 1980s.

Firstly we look at the necessary features of an electronic mail terminal, and use these to compare viewdata with other existing technologies:

ELECTRONIC MAIL TERMINAL FACILITIES

Necessary Features	Viewdata	Facsimile	Telex
1. Simple to use	✓	✓	X
2. Good reception quality	✓	X	X
3. Conveniently located for Managers	✓	(✓)	X
4. Product compatibility	✓	X	✓

Figure 5.1

The viewdata terminal offers all the necessary features to enable it to provide electronic mail according to our earlier definition.

The most compelling argument for using viewdata for sending and receiving messages is its potential penetration into the office. Here are some comparative population projections for viewdata and other office terminals:

ELECTRONIC MAIL TERMINAL POPULATIONS IN EUROPE

Terminals	'79	'80	'81	'82	'83
Viewdata	5	45	175	355	855
Facsimile	35	47	70	103	151
Telex	378	408	441	476	513
Word Processors	75	95	122	154	194

(Installed base in '000s)

Source: Butler Cox and Partners

Figure 5.2

Ultimately, the viewdata terminal, or its successor, could become prolific as the telephone itself, and thus provide an attractive additional message facility to the telephone. The two, side-by-side, would answer a wide range of business communication needs. The role of telex would then be substantially reduced. However physical mail is likely to retain its historic importance for applications outside the rapid transfer of information.

Viewdata therefore does appear to have the right characteristics to succeed as an electronic mail service in addition to its role as an information retrieval service. However, there will be certain restrictions to the usefulness of this medium as it is conceived at the present time.

6. DESIGNING VIEWDATA TO CARRY ELECTRONIC MAIL

Both the viewdata terminal and delivery system will require certain enhancements to make the medium attractive for electronic mail.

Input and output facilities are both severely limited on current viewdata terminals. It would be essential for the business terminal to contain an alpha numeric keyboard for electronic message input. Messages would still be limited to upper case alpha-numerics similar to the telex character set. There is scope for considerable improvement in this area.

Philips have developed a product called the Scribophone, which would enable a manager to write a message directly onto the TV screen. This would be more acceptable to the majority of managers, whose typing skills are very limited.

Viewdata also lacks hard copy output. Again there are developments in low-cost output devices, such as a domestic digital facsimile machine in France, which could provide an inexpensive and highly flexible printing facility.

Perhaps the greatest challenge to implementing electronic mail is within the network itself. The early Viewdata networks do not cater for extensive message processing, nor are they structured to route arbitrary data messages through the network. The development of viewdata systems overlayed onto public packet switched networks such as TRANSPAC in France provide greater flexibility in this respect.

The more rapid innovation anticipated in private viewdata networks is likely to provide such message facilities years in advance of public viewdata services. In addition, private suppliers do not have the same obligations to protect existing services as do the PTTs. For example, the possible impact of a competing electronic message service on telex could inhibit PTT activity in this area.

7. IS ELECTRONIC MAIL LIKELY TO EVOLVE THROUGH VIEWDATA?

Technical feasibility is never a sufficient reason to guarantee the creation of a new market. However inadequate technology can actively inhibit the growth of a market, as facsimile and telex have proven.

The technology of viewdata is rapidly becoming accepted throughout Europe as a low cost way of providing a 2-way information retrieval service. Once established, viewdata offers an attractive entry point for other services such as electronic mail.

The most convincing case for adding electronic mail facilities to viewdata in the eyes of the user will be the small incremental cost of providing such a service. The alternative of investing in stand-alone systems will be too costly in the near future for most users to consider.

However the unknown element will be the PTTs. They are cautiously introducing new non voice services, ensuring where possible that existing services are not immediately threatened. Most PTTs already predict the demise of telex and are planning to upgrade it to a full document delivery service in the form of teletex. The most promising role for viewdata will thus become a successor to telex in the area of short messages which are likely to remain important to modern business, in the same way as the telephone is.

THE ROLE OF VIEWDATA IN ELECTRONIC FUNDS TRANSFER

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Summary

Viewdata could enable banks to communicate with their customers in new ways, and create opportunities for developing new services. Bank customers might be given immediate access to their account information and shown balance levels or transactions on their accounts since their last statement. Banks could use viewdata to keep their customers better informed about the regular payments they make on their behalf. The response facility might be used for sending messages of instruction to banks - to order cheque books or statements, to transfer funds or to make payments.

Key issues in all viewdata banking services will be security of personal identification, data communication and data storage. Personalised banking service will almost certainly be based on private bank databases, but could use the Prestel communication network if on-line interfaces between Prestel and private systems were developed.

The type of services which would be developed will depend largely on the sophistication of viewdata systems installed, and so the level of security that can be achieved. Services to individuals will be constrained by the security that can be achieved by standard Prestel sets. Services to businesses could be more extensive if viewdata terminals in this sector became more sophisticated with local intelligence and processing capability.

Goods can already be ordered and paid for through Prestel by using a credit card number. Making similar payments from a current account using viewdata would require far greater system sophistication to achieve the necessary levels of security. It is therefore questionable whether such a facility would be economic to develop. However, viewdata could be used for settling regular bills where details of who is paying whom can be specified in advance, thereby greatly simplifying the security problems.

Banks would only consider developing viewdata banking services if they can be justified economically. Some, like regular payments might be cost justified against current methods, however giving customers better access to the state of their financial affairs will involve a real increase in service at an additional cost to the banks. Such developments will only be justified if customers are prepared to pay for this increase in service.

Electronic Funds Transfer Today

Any discussion of the way we are all moving towards an electronic age always seems to be incomplete without some mention of the electronic transfer of funds - EFTS - and the plastic path to a cashless society. It must have something to do with the universal fascination with money. It is not my intention to demolish all the myths surrounding the concept of a cashless society other than to say that in the United Kingdom 95% of all transactions are still in cash, and that about two thirds of payments handled by banks are still by cheque. Any move away from this domination of cash and cheques will be slow, however movement there has been, and before considering what role viewdata might play, I would like to describe briefly the position in the UK today.

The pace of change towards electronic payments depends as much on the growing sophistication of bank customers as on initiatives taken by the banks themselves. Clearly the banks have taken the initiative with most plastic card based services. However, so far the use of cards has not been part of EFTS. They either support the cheque system as with cheque guarantee cards, or lead to the generation of paper sales slips as with credit cards. Ironically use of more sophisticated cards which include a magnetic stripe and enable on-line access to the banking system, are used primarily to give customers cash, albeit in an automated way through the latest generation of cash dispensers.

In this country at least, the electronic transfer of funds has depended to a great extent on the ability of bank customers to handle financial information electronically. All payments passing between banks in electronic form are handled by a jointly owned bank computer centre at Edgware, Bankers Automated Clearing Services (BACS). Over half the payments processed by BACS are received on magnetic tapes created and submitted directly by customers. These are largely direct debits and payroll credits. The remainder of electronic payments are largely standing orders where banks submit tapes of payments destined for other banks to BACS and process internally payments to their own customers.

In this country individuals with bank accounts pay for just over half their regular commitments such as mortgages, rates, rent, gas, electricity and regular savings by using standing orders or direct debits. Nearly all monthly wage and salary payments in the UK are processed via BACS, on magnetic tape. In all nearly 400 million transactions are made each year without use of cash or paper, a greater volume of electronic transactions than achieved by any other country, and with not a plastic card in sight.

If that is the current position on electronic payments in this country, where does the information technology revolution fit in with these developments? In many respects the handling of these existing electronic payments mirrors the past technological capability of the more sophisticated bank customers - the ability to produce magnetic tapes to be handled in batch mode, a characteristic of early computer technology. Developments in information technology will be putting a lot more information processing capability into the hands of a great many more bank customers. Money is just information and as such, its handling will be transformed just as will be that of any other form of information.

Increasingly customers might wish to communicate directly with their banks using telecommunication both for sending messages of instruction as well as for receiving financial information. Banks will be able to link their own systems directly to those of a great many of their customers. Automated bank services will have to fit in with this new environment and it is here that I think viewdata could play a part - as a new way for customers to communicate with their banks, and as such an adjunct to existing individual bank and inter-bank systems.

The Issues to be Covered

Before going any further I must stress that what follows is a personal view and a speculative one. Viewdata, if not in its infancy, at least is not yet beyond the kindergarten, and discussions of its use in new areas beyond its first stages of development must contain a high degree of speculation. In this paper I will be describing the sort of bank services which I think could be offered via some form of viewdata system. I will be considering the particular requirements that I think will be necessary for personalised banking services, such as security of personal identification, and security of information storage and transmission, and I will then describe in a bit more detail how a viewdata system meeting these requirements might be used for making payments.

Obviously viewdata banking services will depend on the take up of Prestel and viewdata itself. I will,therefore, consider the way the market for viewdata banking services might develop in relation to the way customers will be investing in their own viewdata facilities. In all this speculation I have not restricted myself to what is currently available solely via Prestel, but anticipated certain developments which I see as inevitable, namely the increasing sophistication of terminals for business use, and the existence of on-line links between Prestel and other databases.

What Sort of Services?

So what sort of services might be developed? From its inception viewdata has been seen as a computerised information retrieval system to be used by anybody, regardless of previous experience of direct use of computers. Banks maintain large quantities of information on computers about the state of their customers' financial affairs, and most customers would not know one end of a computer from another. What better than to use viewdata to give customers direct access to this information in the privacy and comfort of their own homes or businesses.

Keeping Customers Informed

Customers might be given a balance enquiry facility on any of their accounts, current, deposit, loan or budget for example. They might like to see details of all transactions on their current account since receiving their last statement.

Banks make or permit regular payments on their customers behalf with standing orders and direct debits. There is a growing trend in the use of these payment media for budget payments as people increasingly wish to even out their commitments by paying smaller amounts more frequently. However, from personal experience I find it difficult to keep track of all the payment mandates I sign. Banks might use viewdata to tell each customer what regular payments are made on their behalf each month, and maintain for each customer subscribing to the service an additional file showing what other regular payments the customer makes month by month throughout the year to assist in budgeting.

One of the consequences of more use of electronic payments is the need to give customers better access to the state of their accounts, given that customers may no longer have a paper record of each item. The use of viewdata in the ways I have described could be an excellent means of achieving this.

Acting on Customers' Instructions

With the response facility, and eventually the ability to transmit messages between users, viewdata is very much more than information retrieval - it is the basis of an entirely new communication medium. If customers were given direct access to the state of their financial affairs via viewdata, they could well want to be able to act on that information equally directly. Many bank services are initiated by messages of instruction to banks from their customers:

- to order cheque books
- to request statements
- to transfer funds
- to make payments
- to order currency and travellers cheques
- to set up or change standing order mandates

The viewdata response frame could be a vehicle for these messages of instruction. Prestel could probably be used for requesting cheque books and statements as they would only be sent to the address of the terminal if this address tallied with bank records. The other messages of instruction require the bank to debit customers' accounts and to do something with the money - put it into another account, pay it to somebody else or buy something with it like foreign currency.

This immediately raises some thorny questions - amongst others, what constitutes a customer's authority, and how banks will identify each individual user of viewdata banking services with sufficient security. I would therefore like to consider some of the specific banking requirements that would have to be met before going on to describe a possible viewdata payment service. Firstly, how can banks use Prestel at present?

Bank Use of Prestel

Given that the capabilities of Prestel are at present restricted to generalised information dissemination and very simple message transmission, current use by banks and organisations offering similar services is limited to general advertising plus detailed information about bank services - location of cash dispensers, where to use credit cards, loan packages available and so on. The most

interesting use in many ways is the ability to order goods and pay by credit card - more about that later.

More personalised services will require a high level of security for personal identification, data communication and data storage - probably more than is available with Prestel at present. Although as I have already mentioned certain simple services such as ordering cheque books or statements, could be offered via Prestel as it stands, I think the greatest scope for banking services will have to come from viewdata systems tailored to meet specific banking requirements.

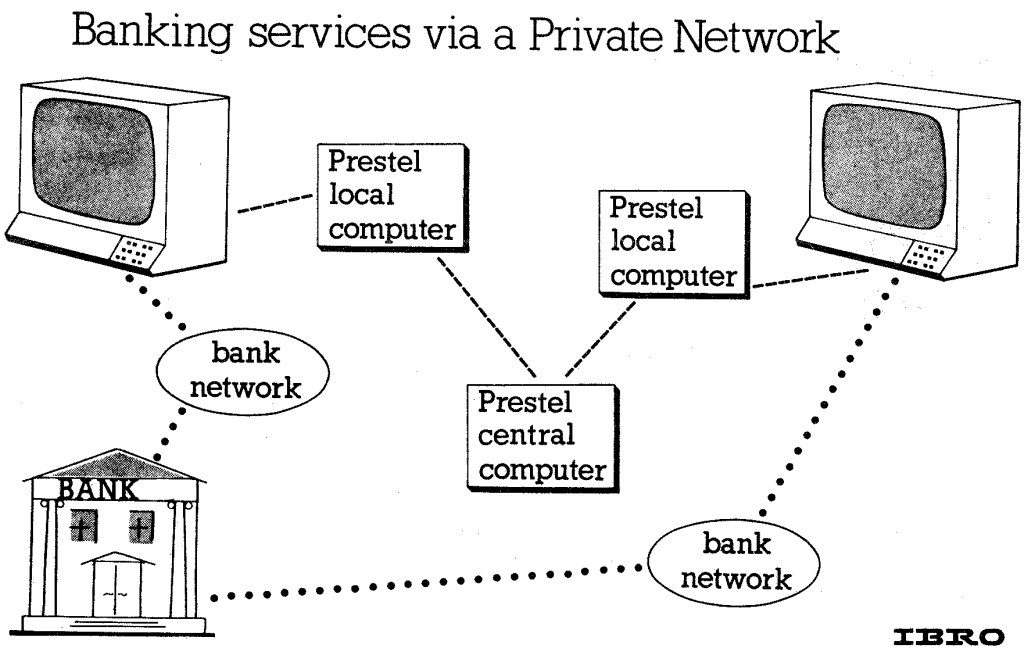
Use of a Specialised Banking System

For security reasons alone, banks will wish to maintain full control of computer files of confidential customer and account information, and so will wish to locate them on secure bank premises. Files with individual records for each customer are going to be very large. These records will have to be stored in highly compressed form, and when interogated by a viewdata system, they will have to be extracted and reformatted as a valid viewdata page.

For these reasons viewdata banking services would have to be supplied either by a completely private viewdata system provided by the bank, and designed to meet its specific needs, or alternatively the banks might need switching and translation capability in Prestel so that users can gain access to bank files kept on bank premises but "transparently". The banks would appear to customers just like any other Prestel information provider.

One thing is certain, services would have to be within a local telephone call distance from customers. A system totally private to the banks would require them to offer viewdata connections to their own telecommunication networks which currently link branches to their central computer centres or provide some other national network. The communications would be parallel to Prestel and might look something like Diagram 1.

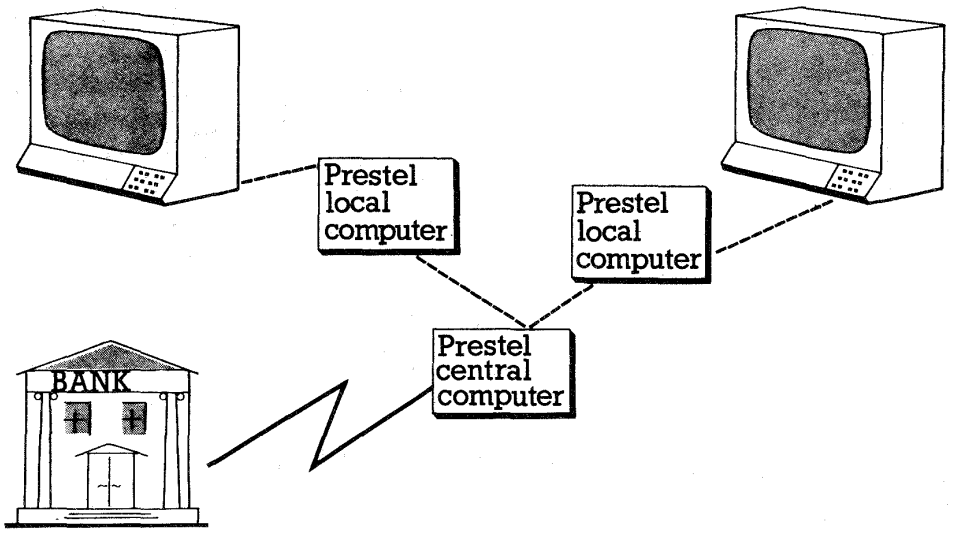
DIAGRAM 1



However, it is more likely that banks would wish to separate their own telecommunication networks used for internal operational purposes from any viewdata system, whose terminal use characteristics would be different from banking terminals. In which case an on-line central link to Prestel would be an alternative, so that the Prestel system would be used for the message switching, as shown in Diagram 2.

DIAGRAM 2

Banking services via a Prestel 'window'



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The final choice would obviously depend on the nature and cost of future Prestel facilities, and the banks' individual policies for their own communication networks. Apart from the need for private systems with specialised files located on secure premises, there are questions of personal identification and secure data communications.

Personal Identification

Secure personal identification will be a key issue in developing any personalised banking service. The various levels of security, both in personal identification and data communication will determine the nature of the services that will be possible. There are at least

four levels of security that might be available, namely that offered by:-

- Prestel and a standard Prestel set;
- a standard Prestel set linked to a private system;
- more sophisticated viewdata terminals with local intelligence and processing capability which will be used for many purposes, but primarily by businesses;
- terminals with specialised banking features such as magnetic card reading devices (features not demanded for any other uses).

Clearly the greater the security, the wider could be the range of possible services which could be offered, however, the fewer will be the terminals and systems with the added security features added. Thus it will be a question of identifying those mass services which require relatively low security, and more specialised services for which customers might be prepared to pay a premium price to take account of the cost of greater security. Whether Prestel is used as the customer's "window" to banking services, or a bank opts for an entirely private system, into which the customer dials directly, I am assuming that most terminals (certainly in domestic locations) will be the standard viewdata TV set, at least within the foreseeable future.

The key to existing automated cash dispensing, and in future possibly to automated payments at the point-of-sale, is the plastic card with a magnetic stripe. The card carries the fixed information sufficient to identify the account being activated. The customer enters in a secret personal identity number (PIN), which together with information held on the card, is sufficient to identify him securely. So long as viewdata banking services to an individual are only available through a specified set, then I see the combination of the unique set number plus a personal identity code to be entered via the key-pad by that individual, as analogous to a plastic card and a PIN.

PIN's are already used with magnetic striped plastic cards in on-line automated cash dispensers and would be the basis of secure personal identification in any point of sale system using plastic cards. If the same PIN were to be used for viewdata banking then encryption of at least this number would be essential. The alternative would be a different PIN and bankers are very reluctant at the thought of proliferating personal numbers, which are likely to get lost or written down by customers, thereby increasing security risks. Whether this is a real problem or not, there is the

question of the need for security of the actual information itself and whether data encryption would be needed.

Security of Data Communication

In the domestic market, which I assume will have only standard Prestel sets, I presume there will not be an encryption capability, so it will be a question of designing viewdata banking services which do not require a high degree of security of data communication. My views on this are probably heretical in banking circles. I see no reason why this choice should not be left to customers themselves. Most individuals, myself included, might feel that their own personal financial affairs are sufficiently uninteresting to anybody else that the use of a standard set, a secret code known only to the individual, and a secure bank database are good enough.

Those not trusting a non-encrypted system, more likely to be businesses, would have to resort either to traditional methods of receiving information from their banks, namely by post, or to invest in more sophisticated terminals which had encryption facilities. The willingness of banks to offer specialisd encrypted services for the few would depend very much on those customers' willingness to pay.

Services to Whom?

Having considered the way viewdata might give customers better access to information about their accounts, and might enable them to send messages of instruction to their banks, and given all the systems issues, where will the viewdata banking market lie? To whom will services be provided given the likely variety of viewdata system sophistication amongst bank customers, and what services are likely to appeal and be developed for different market sectors?

In the personal market bank services via viewdata will be limited by the capabilities of the standard viewdata set. Individuals will be most unlikely to invest in added sophistication simply to obtain bank services in the home. Personal viewdata banking will therefore be constrained by the security features for personal identification and data transmission which will be available via Prestel, or what can be achieved by a standard viewdata set and a private bank system.

There is then the question of why any bank would want to develop viewdata services at all. Some use of viewdata could be a cheaper way of delivering existing services, such as ordering cheque books and statements, and also, as I will mention later, automating certain regular payments. Other uses, such as giving customers better access to their accounts, and more information about their financial affairs, will be a real increase in service, and one that would require considerable investment by the banks in either restructuring their existing databases, or creating new ones. These developments could only be justified if as part of a "gold star" service for which customers were prepared to pay.

Such enhanced services are likely to be attractive to the corporate sector and it is here that most of the initial potential will probably lie, especially given that the early spread of viewdata is expected to be in the business sector. This would be particularly true if business terminals become more sophisticated with local storage and intelligence, and banks are able to offer services involving financial information processing such as cash flow forecasting, financial modelling, and account reconciliation. However, very large corporate customers will soon have (if they do not already have) direct and specialised links with their banks. Thus use of viewdata as a communications medium could well be more applicable to medium and small sized businesses, so long as adequate security can be achieved at an acceptable cost.

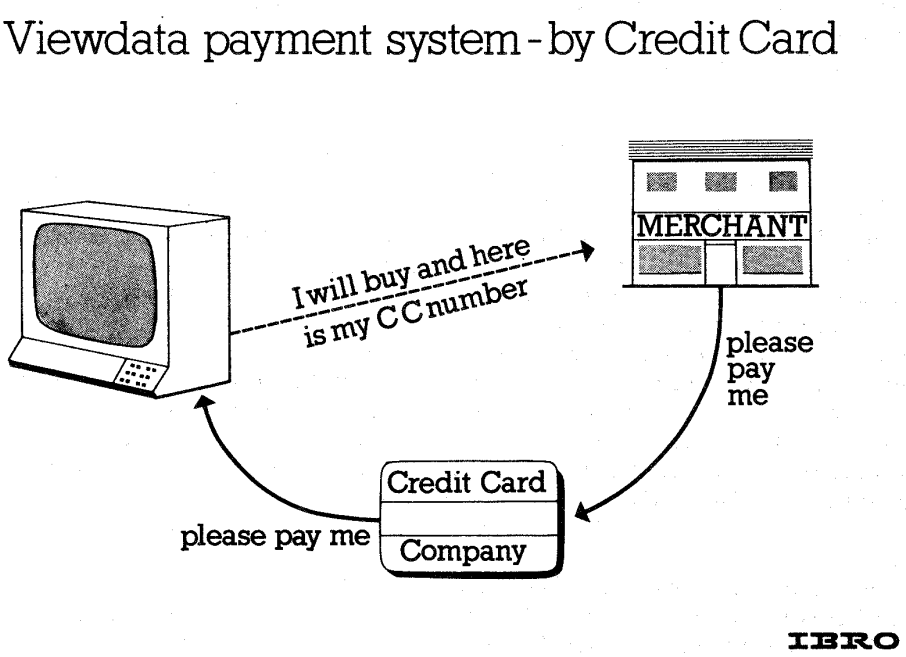
If one considers payment services then it is necessary to distinguish between using viewdata to buy goods and using it to settle regular bills. The former would tend to be spontaneous, once-off payments arising when viewdata was used primarily as a sales medium. Users could see what was on offer, and then order and pay for the goods or services at the same time. Payments for regular bills are essentially pre-determined and apart from amount and exact timing can be pre-specified in terms of who is paying whom for what.

Buying Goods Via Viewdata

Already users can order goods and pay for them via Prestel by using their credit card number. The system is simple and conceptually no different from ordering goods over the phone and quoting the card number, or filling it in on mail order coupons in magazines. Transactions are authorised only if the address to which the goods are to be dispatched tallies with the card issuers' own records. The messages that need to be conveyed are shown in Diagram 3. Prestel merely conveys the necessary information to the merchant who then verifies the payment and collects the money using existing

procedures, as does the card company when obtaining eventual payment from the cardholder.

DIAGRAM 3



Credit card companies already have large and efficient authorisation systems as a key part of their existing operations, so authorising Prestel payments imposes no significant extra cost. If banks were to allow payment on a current account in exactly the same way then they would have to set up such systems from scratch themselves. Unless both user and retailer had accounts with the same bank, these systems would have to involve an inter-bank element, enabling requests for payment made to one bank to be passed to another.

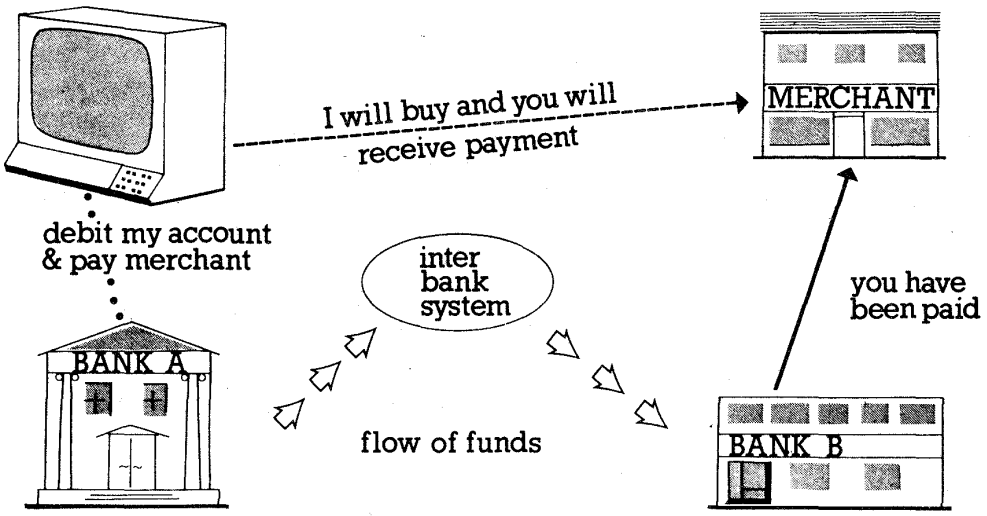
In fact a similar form of payment system already exists with direct debits. However, this depends on bank customers signing mandates specifying exactly who can originate such payments and when, and

direct debits are only used for payments made at regular intervals which are known in advance. I do not think that bankers or their customers would accept an open mandate which enabled Prestel retailers to originate a request for payment at any time for any amount given only an account number provided by such an open system as Prestel. At least with credit card payments the customers do not actually part with their money until they have received their statement from the card company, and agreed to pay.

It is therefore my view that any payment via viewdata from a current account will need to be individually authorised at the moment of the transaction. Thus any system based on viewdata which enabled spontaneous payments to be made from a current account would have to be very different from the current form of Prestel and the following is just one way that this might be achieved.

The Prestel response frame would be the obvious vehicle for telling the merchant that an order was made and that payment would be coming, this time from a current account. A message would also have to go from the user to his bank containing the necessary information to authorise the payment. If encryption facilities existed then some form of coded message could be sent via the retailer who could originate a direct debit complete with authorisation details which only the bank could decode. However, without encryption there would have to be a direct link from the user to his bank as shown in Diagram 4, which shows the flow of messages that would be necessary.

A Viewdata payment system - by Credit Transfer



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The link to the bank to give authorisation could be used to convey sufficient information to enable the bank to debit the user's account, and to create a credit to the merchant, complete with reference information so the merchant would know which transaction the payment was for. The bank could then create an automated credit transfer to be processed by existing mechanisms (BACS if the payment is to another bank) for the actual transfer of funds.

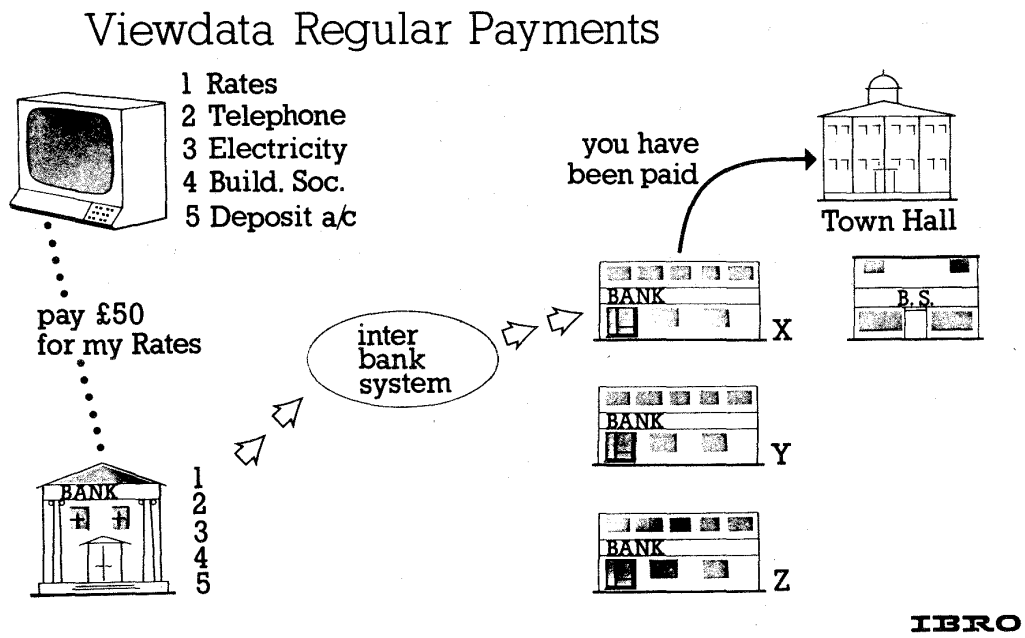
With such a system these would then be a real problem in creating all the information needed by the user's bank to make the payment. Allowing the user to enter it via the keypad is no guarantee of accuracy and would be an unacceptable security risk. It viewdata sets had magnetic card reading devices then some of these problems could be overcome. As this is not a development I foresee, other than in specialised locations such as hotel bedrooms or places with public terminals, then somehow the necessary information would have to be generated and transmitted by combined Prestel and private bank systems themselves. This would require considerable development of Prestel and also need a high degree of cooperation between the various participating institutions.

Given that the same end result - namely the user getting the goods and the merchant getting the money - can already be achieved using credit cards I question whether the facility to make spontaneous payments via viewdata from a current account will be developed. It will involve considerable development costs to overcome the real security problems without giving many additional benefits. However, I do not think the same applies to regular payments.

Using Viewdata to Pay Bills

With regular payments most of the information needed to effect the transaction can be pre-specified - payer's and payee's bank and account information, and the reference number. With pre-authorised payments such as standing orders and direct debits the amount and timing are already pre-specified. However, over two-thirds of regular commitments of personal bank account holders are still settled by cheques or cash. The proportion is far higher for businesses. There are many good economic reasons why certain regular payments should not change to payment by standing order or direct debit. The former are often extremely expensive to the banks where frequent mandate changes are needed, and even the latter can be more expensive if their use means a greater frequency of payments. Many customers value the ability to decide the timing of payments - a facility given to them by cheques and cash. Viewdata could be a cost effective means of permitting customers to make automated regular payments, yet maintain full control of amount and timing. Diagram 5 shows how such a system might work.

DIAGRAM 5



A bank might create and maintain for a customer a file of all his regular commitments. The customer could ask for the information to be displayed and then decide which payments to authorise. This could be a valuable service to corporate customers (in particular small businesses) who could have on file all their regular suppliers. The file could also contain details of other accounts held by the customer and so transfers could be effected between accounts.

It would seem that the fraud and security problems of regular payments would be less than with spontaneous payments. Payment could only be made to specified payees. Control of those who could receive regular viewdata payments would be in the hands of the payer and his bank. Viewdata would simply be a message service between a customer and his bank. Once the bank received the instruction it could initiate an automated credit transfer to be processed by existing payment systems (BACS if the payment is to another bank).

It would seem that the problem of personal identification and confidentiality (and so need for security) are less for most regular payments. Most of such payments relate to regular commitments related to a person's actual residence - mortgage, rates, water rates and utilities. It would not be a great restriction if viewdata payments could only be made from a specified terminal (ie the domestic TV set for households). Personal identification using a PIN, plus the unique terminal number might be deemed sufficiently secure as the incentive to enter false messages is small given

payments could only be made to pre-specified accounts.

The information regarding most householders' regular commitments (in terms of who is to be paid and when) is not highly confidential. For most purposes data encryption would seem unnecessary. Without encryption, it would be up to each customer to decide whether he wanted details of all regular commitments to be kept on a bank file to be displayed on his viewdata terminal for payment. Alternative methods of payment would always be available.

Conclusions

Here then are just some ideas of how viewdata might be used for banking services. The list is certainly not exhaustive.
If viewdata were to be used for billing purposes, particularly if hard copy printers became widespread, then clearly a payment mechanism would be a natural addition. However, I have not considered this in detail as it seems to be a longer term prospect, particularly as use of viewdata for combined billing and payment would require detailed cooperation between many parties. Therefore, by the nature of things such an innovation would take longer to bring about. I have tried to concentrate on services which any one bank could introduce on its own, and so developments which could take place sooner rather than later. However, will even the more basic services I have described actually happen? As with all statements about viewdata services, it depends first and foremost on the take-up of viewdata terminals and the spread of Prestel.

Banking services will be followers only. As a rule people do not invest in new ways of communicating with their banks. As with current automated bank services via BACS, customers use them because they already have, or have access to via bureaux, computer facilities. The same with viewdata. Once customers have sets for whatever other reasons they choose to have them, they might be willing to use viewdata for receiving banking services. It will not be the other way round.

Banks will invest in developing services only if they can see widespread use of them, and either as a means of offering existing services cheaper or as services for which customers are prepared to pay the full cost of increased service or added convenience. Services which can be develoed at very low cost might be offered simply to gain marketing advantage. Viewdata might be a more cost effective means of making regular payments where customers are reluctant to use direct debits, probably the cheapest payment media that currently exists. Giving customers better access to their

financial information will involve the banks in real additional costs without saving on their current operations. Customers will have to pay for this. Ordering cheque books or statements could be a cheap service to offer via Prestel and one undertaken for marketing reasons. Viewdata as a communication medium between a bank and its own customer means that services can be developed by banks individually and without inter-bank cooperation - a process which inevitably slows the pace of develoment. The communication with other banks needed to effect the actual transfer of funds can take place via existing banking mechanisms.

As with all developments in the field of the electronic transfer of funds, and the use of electronic communication without the passage of signed pieces of paper, the banks live in a regulatory and legal wilderness. Use of viewdata will be no exception. The security of any system will be a prime determinant of whether it will be acceptable to bankers and their customers alike when they have to decide to live without the legal protection afforded by traditional paper based systems.

The problems of security relate to personal identification, data communication and data storage. It is my view that banking services will have to be offered through some form of system private to each bank. However, this would not preclude the use of Prestel if on-line interfaces existed between Prestel and private databanks. If those responsible for the development of viewdata recognise these needs, and viewdata sets become really widespread over the next few years, then I see there being real opportunities for banks to develop new services, and home banking via viewdata being a distinct possibility within the foreseeable future.

METHODS OF DESIGNING AND EVALUATING VIDEOTEX

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2. INTRODUCTION

In the sphere of telecommunications systems, an increasing proportion of the cost of development is located not in the technological advance, but in the infrastructure necessary to support an operational system. The Prestel project is a notable example; the technology involved is to a large extent adapted from existing technology. The supporting infrastructure of an operational videotex system, requires the continuous updating of the data base, the provision of information in content and form suitable for the user, and the maintenance of the computer hardware at regional sites around the country. The cost of funding the basic research to make the system technically possible can be seen to be small in comparison with the cost of launching the operational system.

When the costs involved are so high it becomes expedient to build into the progression from technical concept to operational system a series of checks. That is points at which decisions are taken on whether to continue with the project. User research (as opposed to the research required to develop the system) can and does provide information on which such decisions can be based. Traditionally market research has been used either to identify a need for the system (a gap in the existing spectrum of services), or to gain reactions of potential users to its concept. Experimental studies can also be used to gain detailed information about users' responses to a system.

But both these methods of research, valuable though they are, fail to capture two crucial elements of a fully operating telecommunications system. These are the context in which it will be operating, and the individual's commitment to use the system. It is only by observing and monitoring the performance of a system in a realistic setting that it is possible to make predictions with confidence as to its commercial viability.

3. FIELD TRIALS

In order to overcome these limitations, CS&P (drawing on the experience of its predecessor, the Communications Studies Group) has developed methodology for field trials of telecommunications systems which gives the system or information provider a vital information on which to base decisions for future investment. Field trials also supply valuable guidelines for introduction strategy, training programmes and support infrastructure as well as for further market research.

3.1 Goals

We do not claim that the methodology provides a universal package, applicable to all telecommunication systems without adaption; this claim would potentially limit the flexibility and creativity of the research. However, a number of basic techniques developed and tested on other media are appropriate for application to videotex.

For the purposes of this paper the aims and objectives of telecommunication systems providers and IPs can be considered as being essentially similar. Some shifts of emphasis exist between the two groups, but in the interests of economy they will be treated together. There can be seen to be three primary aims of a comprehensive field trial:

(i) to determine system effectiveness
(ii) to assess user acceptability
(iii) to estimate future demand

These three aims are not independent of each other, but have been separated out to emphasize the different components. They in turn are dependent on the fulfilment of other, more specific, objectives:

(iv) to identify system components requiring alteration
(v) to identify factors influencing system use (e.g. the organizational context into which it is being introduced).
(vi) to identify the characteristics of high and low users
(vii) to examine the success of the introductory strategy
(viii) to determine requirements for user education and training programmes.

3.2 Techniques

To meet these objectives, a variety of kinds of data are required:

- Subjective data: Attitudes from users to the system, reasons for use/non-use, knowledge and awareness of the capability of the system, subjective estimates of levels of use, opinions on possible improvements
- Objective data: Frequency of use of system, costs of use
- Comparative data: Bases from other, possibly competing, systems against which the subjective and objective data can be compared
- Longitudinal data: Sets of data should be collected prior to the introduction of a new system (this can be one source of comparative data) and preferably on more than one occasion after introduction, to take account of learning effects and any 'novelty use' effects
- Contextual data: Information on the context into which the system is being placed, such as work patterns, organizational structure, and previous history of changes.

Our experience has led to the development of a multi-facted methodology: combining a number of research techniques leads to a more flexible body of data - and therefore more effective evaluation.

Subjective data is collected by:

- open-ended user interviews
- user questionnaires and closed interviews
- subjective frequency of use data

Objective data is collected by:

- monitoring frequency of use
- monitoring cost of use

The information thus collected can be compared and cross-checked; in addition longitudinal (time series) and contextual data is collected and analysed.

3.3 Dangers

The process of developing the field trial methodology lead to the identification of a number of factors which may inhibit the successful evaluation of a system.

- restricted focus of interest by system operators
- research team called in too late to establish a thorough evaluation exercise
- data required for the evaluation is not available in a usable form
- insufficient level of use of the system during trial period
- conflict of roles for researchers between 'enablers' and 'evaluators'.
- inhibition of potential users because of excessive demands from researchers
- overstimulation of use by attention of research activities.

3.4 Guidelines

Four guidelines have been derived from this work:

- research activities should be multifaceted
- evaluation should be initiated prior to the start of the field trial
- the cooperation of all partners in the exercise is required if coordination of the field trial and the research activities is to be optimized
- unobtrusive methods of collecting objective data should be used whenever possible

4 MARKET ASSESSMENT

One of the three primary aims of a field trial (as defined above) is to determine the effectiveness of the system. In the case of videotex this merits further discussion. Clearly it is not easy to determine the effectiveness of a system the role or applications of which are ill defined. The question is, that effectiveness of the system for what?

This question leads me to a fundamental problem of market research for new media. If there is no clear definition of the role the medium will play, the selection of a user sample and the design of questionnaires is extremely difficult.

Here both CS&P's experience with other media and its techniques developed to investigate current patterns of information usage from a useful background for research in videotex.

Some specific problems which have been faced follow:

- standard demographic sampling techniques do not necessarily reflect patterns of information usage
- the potential of a new information medium such as videotex cannot be regarded simply in terms of straightforward substitution of one medium for another. A significant 'generation effect' is measurable
- videotex is a complex medium; it is both an information and a communications medium and the interaction between these two attributes is not clear
- insufficient data and methodology is available for economic analysis of videotex and assessment of its viability in the market place

In order to overcome these problems CS&P have developed techniques which I shall describe in some detail.

4.1 Sampling Techniques

The identification of patterns of information usage provides data on which a classification of households by information usage characteristics is being developed. It will enable samples to be drawn, or weighted, according to known and quantifiable information criteria which will be more appropriate than standard demographic and geographic sampling techniques.

4.2 Demand Modelling

CS&P's early feasibility studies for videotex concentrated on the economics of system provision and the assessment of potential demand in the residential market:

- by the diversion to videotex of existing expenditure on print media
- by the diversion to videotex of existing expenditure on other information related activities
- by the generation of new information related activities.

Quantitative surveys in these three sectors revealed that:

- existing expenditure on print media would not provide sufficient revenue to support a viable videotex service
- even a small proportion of existing expenditure on information and entertainment oriented activities (specifically education and certain forms of recreation), diverted to videotex, would increase dramatically the potential user revenue, especially from higher income households.

It was concluded from these early studies that assessment of the demand that might be generated by a videotex service could not be quantified by traditional means, and new methodology has been developed by CS&P over the past two years.

5. RESEARCH INTO INFORMATION USAGE PATTERNS

5.1 Method

The research concentrated on patterns of use of a wide variety of communication, information and entertainment media, primarily in a residential setting. The scope included:

- newspapers
- radio and television
- telephones
- face-to-face communication

when these are used for the dissemination of information. It also included new media such as voice response systems as well as videotex in order to assist planners and forecasters in assessing the 'riches' that would be available to these services in the overall market structure.

There are 8 main components to the research design:

- development of a theoretical framework
- preliminary questionnaire survey of household information needs using the Kelly-Grid technique with 413 respondents
- definition of media and their attributes
- assessment of the range and characteristics of media that might be available in the future
- a second wave interview survey designed to build a reliable database describing media use and user choice between media (509 respondents)
- devaluation of descriptive findings from this survey

- development and application of a computer based mathematical model to describe the pattern of user's choice between media, (to provide a means of simulating demand for both existing and future media)

- demonstration of use of the model for the analysis of market potential of selected media

5.2 Findings

As a result of this work, it was demonstrated that very reliable and detailed data on households' use of information media is possible at reasonable cost, and that the 'LOGIT' type of disaggregate choice model is successful in explaining and reproducing the observed patterns of media used by the survey respondents. The model identifies attributes of media which are technology independent; it studies choices between existing media in terms of user preference and attempts to predict the usage of new media by identifying and 'plugging-in' to the model their technology independent attributes. Once its numerical parameters are 'calibrated' by reference to the data on present use of media it can be used to model the demand for new media - or new functional sub-sets of media - and the resulting impact upon the demand for existing media. There are good theoretical grounds for believing that this 'extrapolation' of the model is the soundest means of assessing potential markets for new services yet made available.

The substantive findings of the preliminary application of this model can only be reported here in general terms. It is clear that a wide range of new information media are now technically and economically feasible, or will shortly become so. In addition to videotex, there are extensive possibilities for voice-response and hybrid voice-and-visual media - which we call 'Heardata'. The descriptive survey data allows us to establish exactly what the attributes of existing information media are from the respondent's subjective point of view. For example, the results suggest that newspapers, magazines and books are perceived as quick, cheap means of getting information, but perhaps surprisingly, they are generally seen as rather 'uncontrollable' in terms of the user obtaining exactly what he wants.

Analysis of the data on users' choice between media seems to indicate that factors favourable to intensive use may include:

- pictures and graphics
- hard copy availability
- authoritativeness
- up-to-date content
- speed of access to content
- ease and pleasantness of use
- extent of present use
- presentation in spoken form

Cost and price do not seem to influence choice significantly.

In applying the Logit model to simulating the future market place, our preliminary conclusion is that there is a large potential for videotex though it will be exceeded in size by the markets for existing media and possibly by 'Heardata'. Further work is teamed to substantiate these findings.

These results represent only one stop towards the full application of our improved understanding of demand for information media to practical problems of service definition, forecasting, planning and policy making.

5.3 Further Developments

The work can contribute to management and decision making processes in three ways:

- by providing general insights into the market potential of new media and on their likely impact on existing services
- by providing a means of simulating by computer the outcome of a variety of scenarios, about which new services will find a niche in the overall information market place, what their attributes will be and what impact they will have on existing media use

- by permitting the development of a computer modelling system to calculate quantitative estimates of the future market potential of information media, including videotex.

Quantitative estimates of the market potential of a particular service requires further modelling work. The Logit technique gives a reliable account of choice behaviour for the sample of specific information 'usages' while the resulting aggregated allocation of 'information uses' to media is a useful general indication of the competitiveness of the medium, it cannot be regarded as a reliable quantitative measure of market share, or market size. To obtain such a measure, we would need to:

- assign to each respondent of each information use, a 'weight' corresponding to the frequency of occurrence in that use in the general population (to reflect the stratification of the sample)

- 'gross up' the numbers from the sample activity to yield estimated totals for the economy as a whole - or some chosen subset of it.

In order to complete the quantitative demand modelling system, the following work is in progress:

- the establishment of an Activity Data Base that specifies not only the number of different types of users, (by Socio-Economic Group) but also the frequency of occurrence of different Information Using Events

- the determination of 'rate of change' parameters to enable us to project into the future the composition of Information Usage as indicated by The Activity Data Base. Some of the necessary parameters are easily available; others, such as the rate of growth of information usage per person in each socia-economic growth, will be harder to obtain and require original research

- fuller specification and projections of the likely characteristics and costs of the medium over the next decade

6. HOUSEHOLD EXPENDITURE SURVEYS

CS&P's assessment of potential expenditure on new media uses detailed and extensive analysis of household expenditure patterns in the 'information, communication and entertainment' sector.

6.1 Methods

Time series studies were undertaken; there were three main aims:

- to determine what data resources are available for such studies
- to determine what generalisations can be made from the data that are of relevance to planners, forecasters and policy makers
- to investigate the possibility that the knowledge of household expenditure patterns would provide valuable additional 'input' to demand forecasting for new telecommunication products or services.

6.2 Findings

The Family Expenditure Survey proved to be a valuable data source, despite considerable limitations in the data and the need to assemble a detailed set of price indices so as to be able to analyse the time series in 'real' rather than 'current price' terms.

From a methodological standpoint the conclusions drawn from the work so far were as follows:

- there is no single, optimum way to process and present the time-series expenditure data: different concepts of 'real', 'current price' or 'volume' data series can be developed and applied for different purposes
- there is a high degree of stability in the share of household expenditure being devoted to particular types of goods and services, and in the trends of change in those shares over time.

The trends are related in systematic ways to change in income and relative prices and to the movements of individual items in the market-place. For example, sharp reactions were noted to the arrival - and very rapid acceptance - of colour TV. This provides evidence that a particularly attractive new consumer item can have a dramatic impact on the total expenditure pattern; it is unlikely that videotex (or any other medium) will have such a great effect as colour television, but the arrival of some other, more widely attractive competitor must not be ruled out

- the stability and interpretability of time series data on household expenditure point to the value of these data in assessing of markets for new telecommunications services such as videotex. They enable approximate, but credible judgements to be made of the market potential of the service by reference to the total 'pool' of expenditure likely to be available at any time.

7. SUMMARY

The design and evaluation of videotex systems demands studies at various 'levels'.

7.1 Design of the Service Concept

The conceptual design for a videotex service requires the type of information usage studies that have been described in detail in this paper. Service provider and information providers need to identify the function that is to be served by the videotex service, and how that service will integrate with existing and other new media.

7.2 Assessment of Market Potential

Having identified a 'niche' for the service, the size and nature of the market can be assessed by research such as the household expenditure survey technique which has been described. In addition, field trial and market research studies, geared particularly to the characteristics of information media can be employed. User research at this stage defines short-term developmental requirements such as the characteristic of terminals and acceptable price. CS&P has undertaken such studies on behalf of manufacturers.

7.3 Technical Design

The design of the videotex network will depend essentially upon:

- the type of facilities being offered (e.g. information retrieval, transactional facilities, messaging)
- the size of the network and dimensioning of computers
- the quality of service required
- the content requirements of users

The fundamental research described previously provides a background for work at all these levels. Information usage research will determine user requirements for interactive facilities which will determine the dimensioning and interfacing of the network. Quality of techniques developed (by CS&P) to assess telephone service on behalf of the Post Office, could be applied to videotex to determine levels of service acceptable to both users and information providers. Content and usage patterns will influence appropriate data base structure and searching methods. CS&P is involved in research into the use of alternatives to the tree structure search techniques as applied in videotex.

7.4 Implementation Studies

Content policy and planning studies optimise the taxonomy and organisation of content, and establish viable policies for editorial control and responsibility.

Organisational and management studies ease the implementation of a potentially complex relationship between the carrier and the information provider.

7.5 Evaluation

On-going monitoring of usage provides statistics which are critical to all those responsible for maintaining the quality of the videotex service as a whole. Attitudinal surveys are equally essential to both service providers and information providers for the continued maintenance of a viable videotex service.

The emerging markets for videotex

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Predicting the nature and size of the emerging videotex markets is of key importance, yet there is still little hard evidence from real people spending real money over a period of time to go on. Despite the background of uncertainty, there is an obvious need to predict as clearly as possible by analysis the likely short and long term response to videotex of the marketplace.

Initially the market will be supplier-led, so an examination of the factors motivating service suppliers is a useful start. And the results from a variety of tests with residential and business users are now sufficient to provide an early indication of the way the markets are likely to develop. Although predictions cannot be reliable at this relatively early stage, they can nonetheless form a useful guideline.

The videotex concept is not new, and its technology has been demonstrable for several years. It has generated world-wide interest, and many millions of dollars have already been spent or are now allocated for developments. Yet key questions still remain unanswered. One of these concerns the marketplace. What will be videotex's appeal, to which market segments, and for what reasons? What will be the competition? How will videotex terminals penetrate, and what will be their usage?

There is still very little real evidence available from the marketplace. For example in Britain, Prestel has a head start over other public service implementations, yet information about the market response either from the test service or the early public service is still scant. Elsewhere both public and private videotex service experiments and plans are in early stages of advancement. But valid market information, from real people spending real money over a period of time, is still not available. And because of the different nature and emphasis of the experiments, the results will not necessarily be transferable between them.

Despite this background of uncertainty, there is an obvious need to predict as clearly as possible by analysis the likely short and long term response to videotex of the marketplace.

VIDEOTEX APPLICATION CLASSES, MARKET SECTORS AND SERVICE TYPES

Four broad application classes

What can videotex do? There are four broad application classes:

1.	Information retrieval	Preformatted information frames, maintained on the database, can be transmitted and displayed on users terminals.
2.	Messages	The two classes are "user-to-centre" messages (e.g. to respond to a promotion), and "user-to-user" messages.
3.	Computation	User - entered parameters can be processed by standard programs at the centre.
4.	Software distribution	Program software can be distributed like information retrieval.

Served market sectors

Three broad sectors are clearly distinguishable:

1.	Public sector	Consists of general residential, general business and public access (coin operated or free terminals in public places) terminal markets.
2.	Private CUG sector	Closed user groups in homes or businesses (e.g. estate agents, doctors, lawyers).
3.	In-house sector	Within a single business.

These served market sectors are typically provided for by distinct classes of videotex service:

1. Public services

   These will aim at the public market sector. In Europe, the primary public service providers will be the PTTs (e.g. West Germany's Bundespost with Bildschirmtext). In the USA they will be private companies (e.g. Knight Ridder).

2. Private services

   These will aim at private CUG users, e.g. the CUG operation planned by Holland's VNU publishing company.

3. In-house services

   These are for internal company use, e.g. Whitbread's DAISY which has been operational in Britain for around two years.

Public services aimed at the public market sector have the greatest potential scale, and have to date generated most interest and attention. For the purposes of this discussion, they have the following characteristics: telephone delivery, local call access, and multiple information databases offering a range of information from a variety of independent IP sources.

The videotex industry in general, and public services in particular, will be supplier-led - certainly in its initial phases. Consequently a discussion of the emerging marketplace for videotex can justifiably begin with an examination of the factors motivating the service suppliers to lead the industry off.

Identity of the service suppliers

The suppliers of a public service can be grouped into three : service operators (SOs), information providers (IPs), and TV apparatus suppliers.

An SO typically will provide the videotex centre or centres, distribution channels, co-ordination with the other suppliers and with users, and the commercial foundation for the public service (e.g. user billing arrangements). In Europe, SOs typically are the PTTs.

An IP provides frames of information, either for sale or free of charge to promote another service.

The TV apparatus industry provides adapted TV terminals together with promotional, distribution and sevice operations.

Factors motivating the SOs

SOs profit from high system usage.

The factors encouraging their involvement are:

- Profit, from service operation, as with on-line database and timesharing bureau services.
- Increased telecoms revenue from increased telephone usage.
- Positioning for the future, particularly apposite for European PTTs.

Factors discouraging involvement are:

- Investment risk in a market whose size, nature and rate of emergence is still uncertain.
- Regulatory constraints.

Factors motivating IPs

IPs profit from accesses made to their information frames.

Factors encouraging the involvement of IPs are:

- Profit from frame accesses, by direct or by indirect (promotional) selling.
- Cost reduction by reducing expensive alternative information forms (e.g. printed directories).
- Learning opportunity with a new medium - important for the future "less paper" society.
- Instant feedback about individual frame usage.

Factors discouraging IP involvement are:

- Investment risk - as for SOs.
- Uncertain applications - there is still considerable doubt about which applications will prove to be popular in the long term.
- New unexplored territory.
- Copyright and security issues concerned e.g. with information ownership, enforcement and security against unauthorised access from other users and other IPs.
- Need for new design skills both for database design and for individual frame design.
- Ongoing frame maintenance commitment.
- Visual limitations inherent in today's videotex technology.
- Need for heavy promotion to create awareness.

Factors motivating the TV industry

The TV apparatus industry profits from the sale of adapted TV terminals; terminal usage is only a secondary consideration.

Factors encouraging TV industry involvement are:

- New TV product, when the regular TV market has reached saturation in many countries.
- Mass market potential, consequential to TV's role as a mass market medium.
- Prospect of expanding into the business marketplace, as yet barely exploited by the TV industry.

Factors discouraging TV industry involvement are:

- Investment risk, as for SOs.
- Unfamiliar market, with the emphasis on information rather than on (traditional) entertainment, and involving wholly new partnerships.
- Standardisation problems, resulting from the many different transmission and display standards now being demonstrated.

- Promotional concerns, similar to those confronting IPs.

- Alternative investment opportunities in the traditional entertainment area, e.g. VCRs for time shift recording of broadcast video; videodiscs for low cost playback of pre-recorded video material; and projection screen equipment etc.

Mass market profit potential

Overall there is little doubt that at mass market volumes there are real profit opportunities for the three groups of service suppliers, at prices which the mass market might be expected to pay. But videotex prices are highly volume sensitive, and at lower volumes the prices may well be too high for mass market penetration. It's a chicken and egg situation. However, there are plenty of precedents. Colour TV itself is a good example.

It is because of these profit opportunities that the service suppliers are joining in the current spate of world-wide experiments. But the key questions remain uppermost in their minds. Will videotex's mass market potential be realised sufficiently rapidly to justify major investments at this time, and what is the best strategy for expanding the market?

RESPONSE OF THE GENERAL RESIDENTIAL MARKET

Factors conditioning the residential market response

In the same way as for the service providers, it is useful to identify the key factors, both for and against, influencing the market response. (Determining the relative importance of these factors is more difficult).

Factors encouraging residential usage:

- General information service in one place in the home.

- Status and exclusivity of a new device - which can be relied upon to attract a small proportion of householders.

- Access to information which is up to date and possibly hard to obtain otherwise, with high momentary value, e.g. share price information, or what to do in an emergency.

- User-to-centre message service permitting response to material promoted either through videotex or through regular TV.

- User-to-user message service with store and forward, to some extent eliminating the frustration of busy telephone lines and unanswered calls.

- Source of software for TV games and home computers.

Factors discouraging residential usage:

- Need for new habits, to use a TV terminal as an information source.

- Need for new skills, for example in database searching.

- Doubts about the value of the information service, when information frames are hard to distinguish from promotional frames, and where the "stamp of authority" of the printed word is lost.

- Poor visual quality, from both a typographic and pictorial viewpoint.

- Invasion of privacy, resulting from the fear that "something out there knows what I have been looking at".

- Conflict with TV and telephone in their normal roles.

- High price and competition from alternative spending opportunities.

Three of these factors deserve special attention: information which is up to date and often hard to obtain otherwise; the price of videotex; and competition from alternative spending opportunities.

Information on videotex

Early public videotex implementations are emphasising the information retrieval application, particularly in Europe. Britain's Prestel is a good example, where the purpose of limiting the range of applications at this early time in its public service is to avoid degrading response times by overloading the processors.

The Prestel experience with residential users shows some fall off in the usage following terminal installation, with lack of adequate and complete information cited frequently as the cause of disenchantment. Most Prestel information is for sale. It is the adequacy and attractiveness of this information which is a prime determinant of Prestel's usage. However, it is still not clear which classes of information are most suitable for Prestel, and most likely to support continuing user loyalty. The most likely class is highly volatile information with a high momentary value, permitting users to answer an immediate pressing question.

The European culture accepts that information is a commodity which can be sold to the public. In the US this is not so readily accepted. The perception is more that information should be given away free through videotex in a way which promotes secondary sales - for example the use of a particular credit card, bank facility or travel company.

Price of videotex

Traditional on-line database services are too expensive for general residential use (typically around $1 per minute). Moreover terminal operation is too complex, and the range of information offered is too specialised.

Besides being easy to use and offering a range of general information public videotex services should be relatively inexpensive. An inclusive price of 20 cents per minute is already in sight for a medium scale service supporting perhaps a quarter of a million residential users.

This guideline price is based on current technology, and is inclusive of TV terminal amortisation, telephone line usage, connect-time to the videotex centre and frame access charges adequate to more than cover the costs of IPs.

The price guideline is based on projections for Prestel in its current form, supporting a total residential population of just over a quarter of a million. Although expensive by traditional on-line standards, Prestel is certainly not cheap for the average residential user. Projections show an average frame price to the average user of around 5 cents. The all-inclusive connect-time charge is around 20 cents per minute, equivalent to the price per minute of a new short play phonograph record played only once and then discarded.

However, videotex prices are highly volume sensitive. Above a user population of about quarter of a million, service prices should reduce and still be at the level at which service providers can expect to see profits.

Competition from alternative spending opportunities

Most people, consciously or subconsciously, will trade off the costs and benefits of videotex spending versus spending elsewhere - or not spending at all.

The choice of videotex will require a conscious decision to allocate discretionary income to it, rather than to an alternative. The alternative may not even need to be in the information service area. There is some evidence to support the view that with increasing affluence, an increase in proportion of the household budget is

allocated to information in its broadest sense. Even if the proportion of household spending remains the same as now, for countries with growing national incomes it will be a proportion of a larger whole.

But it does not follow that information spending will necessarily be allocated to videotex. What are the alternatives? They can be characterised as existing information services, and other new services apart from videotex. There will also be competition from other spending opportunities, not related to information.

1. Existing information services

   These include books, magazines, newspapers, catalogues, brochures, circulars, advertising papers; together with TV, radio and telephone information services and so forth. They are established and understood. Their benefits are clear. Printed information offers portability, the ability to browse, a capability for high quality colour pictures and so forth. But videotex has its advantages too, e.g. it permits access to a very wide information database which can be kept up to date. Because each medium has its own advantages and disadvantages, it is most likely that they will complement rather than substitute each other. One important implication of this is that net information spending must rise, if videotex is to be accepted.

2. Other new information services

   For information retrieval these include low cost local storage systems, and teletext. Low cost local storage systems such as the digital videodisc will be appropriate for mass storage of non-volatile information. Teletext, the one-way broadcast information service, is very appropriate for limited volumes of highly volatile information, e.g. news headlines, sports results, weather reports and share price movements.

   There are other new information services under development which will compete with videotex in application classes apart from information retrieval.

3. Other spending opportunities

   In practice, the first step in a new user's commitment to videotex takes place at the point of decision to purchase a plug-in TV adaptor, or an adapted TV. So in practice videotex will usually be perceived as an alternative to other TV related spending opportunities such as:

- improved TV, offering superior cosmetics (e.g. programmable controls) and enhanced quality
- additional TV (multiple TV households are still relatively rare in Europe)
- programmable TV games
- video cassette recorders, primarily for time shifted viewing
- videodisc, for low cost original video (e.g. new movies and opera).

These alternative TV related devices are compelling counter attractions to videotex.

Choice of videotex

The four key factors which finally will influence people in the residential marketplace to choose and to use videotex come down to these:

1. Availability of service

   This includes awareness of the service following promotion, ease of terminal acquisition, ease of connection to the telephone network and so forth.

2. Need for the service

   This centres on the need to be informed better than now, and to be provided with supporting services including message and software services better than now.

3. Ability to pay

   This includes ability and willingness to pay not only for adapted TV terminals but also for continuing usage of the service.

4. Willingness to change

   This includes change of habit and ability to acquire the new skills demanded by videotex.

Reviewing these key factors with a national perspective throws some light on the question of which countries will reach large scale use of videotex in the residential marketplace first. For example, West Germany with its relatively well developed cultural desire to be kept informed, together with a high disposable income and willingness to purchase up market consumer durables, must be a clear candidate.

RESPONSE OF THE GENERAL BUSINESS MARKET

Factors influencing the business response

As for the residential marketplace, it is instructive to consider the key factors likely to influence the response of the business marketplace.

Factors which will encourage use:

- Low cost of implementation and usage, resulting from low terminal costs (particularly with volume production), and minimal software development overheads.
- Easy to use - requiring no operating instructions, the terminals are user friendly and convivial, and the system (conceived for residential users) is essentially simple to operate.
- Access to valuable services, including company financial and share price information.
- Common standard, potentially permitting international use.

Factors which will discourage usage:

- New standard, which is different from existing well-established terminal standards and protocols.
- Too simplistic. Although simplicity encourages wide general use, it does not necessarily encourage specific problem-oriented use.
- Doubts about service availability, due to port overloading.
- Competitive moves by established suppliers.

Choice of videotex

On the face of it, many businesses may find that the attractions of a public videotex service - centering on the information service - may be insufficient to justify its use. In practice though, synergy will have an important role to play: many businesses may well find they can justify the use of videotex terminals primarily for private and in-house use (see below). Their additional use at marginal cost to access a public service will ensure the future of that service.

RESPONSE OF THE PUBLIC ACCESS MARKET

Public access applications, using pay-and free-of-charge terminals in public places, will be restricted to information retrieval and messages probably of the user-to-user class. Pay terminals accepting cash in advance (like public telephones) are already in limited use in Britain. In the future, public terminals offering payment by credit card are likely to appear.

It is not hard to anticipate their use for disseminating information required urgently, and otherwise hard to obtain. Positioned in places like hotel foyers, citizens advice bureaus, libraries, shopping arcades, airport and railway terminal buildings and public houses, they will be used for information such as local events, late night shopping, how to get there, accommodation, timetables and prices. Like pay telephones, public videotex terminals are likely to become a familiar part of the scenery in the years to come. But their acceptance will not be rapid. It will follow some years behind the residential and business marketplaces. Entrepreneurs, and even European PTTs, are unlikely to invest quickly in these terminals except in special cases.

PRIVATE CUGs : SERVICES AND MARKETS

The ingredients of a private CUG service are essentially the same as in a public service, involving the participation of SO, IPs and TV terminal suppliers. But because CUG operations can be viable at much lower volumes than public services, the need for co-operation and co-ordination between these disparate service suppliers is less acute.

CUG operations serve specific user needs. The factors motivating the service suppliers are much the same as in a public service. And the factors influencing usage are similar to those for general business usage. But there are two important changes in emphasis:

- The information, rather than being of general value, will be of specific value by definition. Sometimes it will be critical to business efficiency.

- Lack of security and doubts about service availability will be important concerns (though they can be overcome by careful design).

Overall, private CUG operations will prove to be highly attractive for a variety of specialised business users. Examples include estate agents, travel agents, doctors, lawyers, farmers and other professionals characterised by a need for timely information and disparate, generally relatively small scale operations.

Many of the current videotex experiments world-wide are placing a strong emphasis on CUG operations. In Britain Prestel is already proposing a dedicated CUG computer service in addition to CUG services provided through its regular public service Prestel. In Holland the largest publishing company, VNU, is offering a dedicated CUG operation in competition to similar CUG services to be offered by the PTT as part of its public service. In the USA, it appears likely that INSAC's main concern will be with CUG operations for businesses.

IN-HOUSE SERVICES

Compared with traditional terminal-oriented in-house business information services, videotex offers some real attractions:

- easy use - no operating instructions, and the "user friendly" videotex characteristic
- colour and simple graphics, adding immensely to the warmth and attractiveness of the system
- low cost terminals
- access to in-house company information, and through the same terminals and the public switched telephone network to public videotex services.

Another point - which may be construed as either an advantage or disadvantage - is that some companies may be able to implement an in-house videotex service with little or no involvement from the management services or data processing departments.

Two disadvantages, already mentioned for public business use, are the simplistic nature of videotex, and the involvement of a new standard.

PENETRATION AND USAGE OF VIDEOTEX IN THE MARKET SECTORS

Business will be the lead-in marketplace for videotex, in terms of both volume of terminals sold, and usage. Both private CUG operations and in-house services (generally amongst large companies keen to experiment with simple user friendly systems), will be important. Business usage of public service videotex will attract increasing interest, often as a consequence of, rather than a precedent to, these private services.

Terminal sales and usage in the residential marketplace will follow business use. Penetration of the residential market will begin with professional people and white collar workers - not the same demographic profile as caused the growth in colour TV penetration in Europe in the 1960's. The professional and business people leading

off the residential market will perceive the value of videotex more readily than others, and be better positioned to judge it by results. Some will be equipped with terminals as a perk. Most will already have experienced videotex in their business environments.

Usage in the residential marketplace will develop slowly and steadily as terminal prices drop. New users will include graduates from (more limited) teletext, and families with children for whom the educative contents of the database will be a strong incentive. Others will be the small proportion of a national population dedicated always to acquire the latest device.

Residential terminals will be positioned as up-market. There will be some confusion with teletext, certainly at first. In Britain and West Germany, it is conceivable that by 1983 around 10% of all TVs shipped (around quarter of a million per year) will have a videotex capability. Also by 1983, the French PTT expects to have distributed at least a quarter of a million monochrome videotex terminals free of charge to residential users for telephone directory applications. But probably fewer than half of all the videotex terminals shipped to the residential market will be connected to the telephone network, and those which are connected may experience relatively infrequent usage. So in its early years in the residential marketplace, videotex may prove more valuable to TV suppliers than to SOs and IPs.

At first, the main application in both residential and business marketplaces will be information retrieval. Typically the information will be volatile, compact and with a high momentary value - for example business financial information, price comparisons, classified advertisements, what to do in an emergency and so forth.

Beyond 1983 both applications and terminal designs will begin to change. Residential market terminals will be characterised by increased intelligence, permitting local storage of multiple frames, manipulation of stored data and - in some cases - superior graphics. The software distribution application will become important for personal computers. Indeed there will be a noticeable convergence between videotex terminals and personal computers.

Message applications will also become important. These will be both for user-to-centre messages for example for "teleshopping", and also user-to-user messages taking advantage of videotex's store and forward capability.

Conceivably both videotex and personal computers will develop independent of the TV, whose prime role will continue to be entertainment, displaying video transmitted through cable, off-air, from VCRs and from videodisc. Display terminals for videotex and personal computers could begin to develop independently for the information role. In the home, such terminals may well be placed in the kitchen or hall rather than in the living room, which is the centre of home entertainment.

In this scenario, broadcast teletext will continue to be TV-oriented. The pressure for compatibility between teletext and videotex services could decline and even disappear.

In the business marketplace, videotex terminals will evolve to provide a much increased capability. For example, compatibility with teletex - the European proposal for a communicating word processor standard - is a strong likelihood.

Prestel: The Opportunity for Advertising

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How is advertising developing on Prestel? What are the main opportunities?

Prestel is an interactive media - the user chooses what to look at and can order off the page.

How do you get the viewer to choose to see your message? What is the role for Prestel in brand building? Is it the direct response dream? - What is the divide between editorial and advertising?

How many sets? Who is the audience? What are the creative skills - writing or routing? What role will Agencies play? Likely cost per thousands? Will IPs and advertisers cooperate or compete? Is sponsorship the main opportunity for major advertisers?

Introduction

My start point is the assertion that advertising will increasingly develop on the videotex systems as advertisers take advantage of a new medium in an environment where existing media are increasingly congested and take advantage of the presence of an interested rather than passive audience. To be effective, the advertising will have to take account of the great difference in the way the target audience are likely to use this media.

This, I believe, represents an enormous challenge to the advertising industry and one where the answers are likely to evolve over time as experience teaches us lessons.

Another fundamental point which, I hope, will come out of this paper is that the development of advertising on Viewdata should be given every encouragement, as the commercial impetus that the funds and inventiveness that the advertising industry can bring will greatly aid the growth of the system itself. The early development of advertising will also bring the benefit of helping those who have invested, for them, considerable sums in Viewdata and have inevitably yet to see much return.

I think it will prove to be very important that IPs take early account of the likely growth of advertising on Viewdata. As the entry of commercial interests on to the system who are seeking benefit from their presence that is not related to the revenue derived from the dissemination of the information itself will, in effect, provide strong competition, damaging the interests of IPs unless they recognise this early, harness it and take advantage of it for their own profit.

Viewdata Features

There are currently about 200 information providers with about 150,000 pages of material on the system, both the number of information providers and pages are likely to grow enormously so that before long there will be literally millions of pages available to the public. Most of the information providers are selling their information, receiving their revenue by charging for each page used, although some are providing the information free as a service e.g. timetables to travellers, product data to people wanting to buy a product.

The information can be kept entirely up-to-date - a unique advantage which could provide a strong motivation for all sorts of advertisers to use Viewdata.

Readers (viewers) will approach and use the system in a different way than the other media we are used to using in advertising. Generally speaking, they will be seeking information and expecting it to be up-to-date. They will be guided by the routing systems to the answers to their questions. There will be little, if any, scope for casual readership. One of the most basic tenets of advertising has been that the reader or viewer is not seeking out your advertisement but is using the medium for some other purpose. It has been the object of advertising to attract attention to itself by its distinction and relevance to an audience who are just passing by. We have been used to captive audiences flipping pages or sitting through a commercial break or passing down the street past a poster site. There will be virtually no casual readership of Prestel. The user will come to the page with the information he wants and then leave the system, not because that is the nature and purpose of Viewdata and because there are direct costs to the user that mount the longer he uses the system. I believe this self-selective nature of the medium to be its most fundamental difference from other media.

I ought to add, however, that there will be some happening on advertising material that was not directly intended by the reader when he started to use the system but this will not depend so much on the creative brilliance of the advertisement as on the cunning of the routing system that leads the reader there as the answer to his question. This goes some way to illustrate the likelihood that the real creativity in the use of Viewdata as an advertising medium will lie in those who create the routings rather than in those directly creating the advertisements.

Other features we should bear in mind are:

It will be interactive, users will be able to 'buy' off the page and will be able to use it as a computer terminal. Prestel will be able to act as a giant calculator.

Compared to the costs involved in changing copy in press advertising, it will be very cheap for advertisers on Viewdata to keep their copy up-to-date and to make small changes at small expense.

As a medium, it will be expensive at first, its early growth will certainly be amongst the richer sectors of the public, probably with a bias to business and those private individuals with expense accounts. Because it is new and expensive, the ownership of the Prestel sets in the early days will seem to confer some prestige on its owner.

Peoples' attitudes to this new medium are likely to be different to the sorts of attitudes they bring to national newspapers or television or local press. I think it will probably be seen as a medium that brings a fair degree of authority with it, because it is a service providing answers and information, and because it appears on a television. At the same time, I think it is likely to be seen as a fairly sober medium. While it will have some fun and games, its prime purpose will be informational and it will not be jazzy and full of sound and movement as for instance are television commercials. I think this might make the medium particularly attractive to some of the newer and smaller professional advertisers. With the early bias of readership being business and up market and production costs being relatively slight, some of the earlier advertisers might be drawn from amongst lawyers, stockbrokers, estate agents and such small businesses who provide professional advice.

However, the real growth of Prestel almost certainly lies further down the social scale as it will provide information in an easily accessible form to those who currently have only limited reference sources available. It could be argued that eventually the system will be widely used by those with some dislike or fear of normal print media but who bring a different attitude to the friendly, entertaining television set in the corner of the sitting room.

Finally, it is certain that Viewdata is going to present us all with a difficult creative challenge. The constraints are very tight. Although there is a facility of colour, and some rough pictorial representation is possible, it is primarily print on a pretty small page. The graphic challenge is enormous and has barely started to be tackled. Even greater, I think, is the challenge of routing, understanding the ways in which people will approach the data so that the routing to the information we show them is provided in the most relevant and easy form. Only experience of how people actually use the system will allow us to develop the most relevant routing pattern, and indeed only experience of the use that people make of the system will allow us all to develop what we put on Viewdata and in what form we put it on. It is certain that such a wholly new system will evolve and will actually be very different in five years from our current primitive understanding of it.

Advertising on Viewdata

To talk about advertising on Viewdata we need first to have a view of its likely audience. We believe that eventually it will be a universal medium with a usage as wide as that defined by usage of telephone and television. Clearly though, it will start at the top of the market with the earliest growth being business usage. From what we have seen so far, it is quite likely that the earliest growth will be on a trade by trade basis. We will shortly have virtually saturation coverage in the travel industry. Other industries where currency is particularly important may follow with a speedy build-up e.g. estate agents, possibly lawyers and so on.

The major institutions in the City either have or will probably shortly have Prestel available to them.

In the home market, the early users will be A's and B's, probably with strong business bias and a high information requirement.

There is already a fairly well developed advertising use of Prestel, and that is advertising that overlaps with the mainstream informational purpose of the system. There is plenty of advertising on Prestel now which is information in its own right - advertising which is, in a sense, editorial. It is advertising which provides information which the reader is likely to find useful in itself. The clear division between advertising and editorial that exists most of the time in most other media really is not there in such an easy way on Prestel. A list of what is available, at what price, today in your local store is a form of advertising but it is so close to other forms of information of Prestel that we really are dealing with something of a grey area.

There are a number of different sorts of advertising that can come under this first heading, the most obvious is classified advertising.

On the face of it Viewdata systems are pretty uncompetitive for classified advertising as the amount of classified information you get per p. on Viewdata is vastly less than you would get in a newspaper. But I do not think that means it would not develop, it just means that it will develop on a slightly different basis and that basis will take advantage of the routing method by which the reader reads the advertisement of his choice. This will allow classified advertising on a much more tightly targetted basis than we find in the press. For instance, the reader would only start to pay for the classified advertisements if there was an advertisement there that met his exact specifications.

It might be that you would only have to pay for an advertisement if, say, for a car, it was the year and the model that you were seeking and available in your area. The same would be true of job advertisements. Only if there was a vacancy for the skill you had, local to you, and at the sort of rate you would consider would you need to pay for using that page. Of course, for this sort of use to develop in the way I have described, there needs to be a large number of classified advertisements on the system so that the reader is not going to be disappointed, and, for that reason, it may be some way off. If, and when, it does develop, however, it could become a major attraction of Viewdata itself, as classified advertising is to local papers, and play an important part in the spread of the system. I suppose it is likely in the early days that this classified development will be biased towards business, with advertisements for services to businesses - office furniture and equipment, insurances and such like.

The second use under this heading is even closer to editorial matter than classified advertising. With an up market early target audience for the system, I think we will see a considerable development of advertising for entertainment and leisure activities - where to go, what to do. Again the nature of Viewdata means that the way that this sort of advertising will be presented will probably be very different to that in the traditional media. The routing system will allow considerable detail to be given on the chosen pursuit and it will be up-to-date. In helping you choose a particular play you may want to see tomorrow evening, you would possibly be able to see a number of reviews of plays, and check seat availability, and, possibly, eventually even be able to book tickets. This could become a practicable proposition for advertisers because of the relatively low production charges for late changes to copy; for the reader you would have the whole spectrum of activities that you could indulge in but you would have vastly more depth of data than you could get from any other single medium in checking both that that is what you want to do and whether there is the availability at an acceptable price to allow you to do it.

The major single use already developed is that of rental advertising. The Comet advertisements provide a splendid example of what will probably be a vast amount of retail price and availability information, kept up-to-date and of course eventually offering the ability to buy direct. Advertising like this is somewhere in a grey area between advertising as we normally understand it and brochures

and price lists. The amount of detail possible on Prestel really makes this advertising more akin to brochures but as the readership of Prestel develops, it will increasingly replace informational and price list retail press advertising and there are huge amounts spent on advertising that way these days in the press. To this extent, I think Prestel presents a very real threat to the advertising revenue of the press. Not only is this a huge area of advertising but it is the fastest growing in this country today. Of course, before any serious inroads will be made into press revenues, the placement of sets will have to be fairly widespread but the advantages that Prestel can offer over the national press for this sort of advertising are immense - comprehensive,up-to-date, low production charges and a facility to buy direct.

Another whole area of retail advertising for which Prestel is ideal is direct response and again this is already developing on the system. Neither press nor television can compete here once we see substantial household coverage of Prestel sets. The whole process of choosing and buying a holiday, for instance, could be carried out from the Prestel set without recourse to travel agents, newspaper advertisements, the post, brochures or telephone calls. It could all be done from one medium in your home on one occasion. Prestel will be very attractive to direct response companies.

I think a third area for retail advertising which will develop on Prestel is outside the mainstream of retail advertising and that is for end-of-line sales, the facility to keep what is on offer entirely up-to-date allows the direct advertising of a finite availability line. As this sort of thing is almost impossible through traditional advertising media, I think we may see a whole new sort of advertising and a whole new sort of business developing around this possibility. I suppose the thing most directly replaced that does exist would be the wine end-of-bin offer advertisement. One of the main eventual benefits will be that perhaps we will no longer see advertisements with that ghastly cliché "while stocks last".

A final editorial use of the media would be for Clubs and Associations. It is already being examined by the mail order companies to reach their agents, but it could also be a medium for the AA and other clubs and indeed for clubs invented specially for their application on Prestel.

These then are the forms of advertising I can imagine developing on Prestel, but lie between advertising and editorial. I would like to go on now to investigate advertising of a sort we are more used to i.e. that which sits alongside editorial but is pretty clearly differentiated from it. Here I am talking about advertising which appears amongst IPs supplied information and where the advertiser is seeking to gain access to the audience for advertisers. I suppose the most obvious form of advertising we are going to see here is a sort of football stadium advertising of a single line at the base of the IPs page. Presumably this sort of sloganising will develop in the early days on related interest pages, for instance, a car manufacturer might take the base line on one of the IPs motoring pages to deliver a short general message, presumably their cooperate slogan. There is plenty of scope for this sort of advertising right now.

A second sort of advertising along these lines that I can imagine is cross referencing from interest related pages. Here, for instance, on a page giving information about baths, types and colours, a plumber might take a short one line advertisement at the base offering his fitting service. The Birmingham Post and Mail has already demonstrated this sort of advertising with the hotel advertising at the base of pages with information on exhibitions currently on at the National Exhibition Centre. Again I can see great scope here - it will probably develop through the development of brokerage, through companies springing up who make their money from putting potential advertisers and IPs together to exploit this sort of opportunity. I fear this sort of advertising is unlikely to win any creative prizes - it would be difficult to do much with the few words available.

Then there will be that advertising that cannot be squeezed into a single line and here I think we will have something of a 'come on' advertisement slotted into related interest pages. This will be the sort of 'find out more - go to Page 2617'. There has already been some development along these lines by corporate advertisers: I can imagine much more. For example, one could imagine Cadbury Schweppes taking one line on pages giving their company details offering more information and some other bonus like a Chairman's statement on the prospects for the next year by turning to their page. The prospect of being able to give company news and views direct to the world, without the intervention of the press must be very attractive to companies and organisations often feeling unfairly treated. But I think there will be a general principle where advertisers can offer further details, obviously with some bias to their own point of view, on pages giving information about subjects that touch on their business.

Another use will just be based on the close-targetting that will be possible, going onto IP pages where you are pretty certain of the nature of the readership. An instance possible now would be to offer services of interest to travel agents via the Sealink pages (e.g. the development of industrial advertising - secretarial services, photocopiers, travel agencies), assuming they were willing to take such advertisements. A more cunning development of this possibility might be to adapt one's advertisement for a general interest product to make it relevant to a specific sub-group that one knew was likely to be reading that particular set of pages. One might for instance, go about reaching finance directors via corporate analysis pages on Prestel and offering a financial advantage to your product, that is, pulling out the relevance of your product to that function.

At the other end of the spectrum will be those attempting to reach the largest possible audience by seeking to buy into the high traffic pages, presumably news and weather and so on. This will be back to the football stadium type of sloganising at the bottom of the page.

A third area concerns the quasi advertising use of Prestel. I think there will be all sorts of ways that Prestel will be used by advertisers that is not directly advertising but more promotional in its intentions. I suppose the extreme will be the offer of the Prestel facility when a particular establishment is used, i.e. if you shop at X's shop, one of the bonuses of shopping there is that there is a Prestel set that you could use while on the premises. This could go further and become a known part of the service, in particular, chains of hotels, garages etc. In some outlets the role of the Prestel set could be more direct in building a confidence on the part of the customer in the service a retailer is offering. I think there is likely to be an element of this in the use that travel agents are making of Prestel, where seeing the data on Prestel gives the customer confidence in it and also presents an aura of modernity and efficiency to the outlet. So there could be a whole development in the placement of Prestel sets that is not just to do with the virtues of having a set, but because of the way it will reflect on the outlets that have very complex stock. It would be a great help to all shoppers if all builders merchants were required to have a Prestel set and told you exactly what they had, at what prices, and for what job. In outlets like that where, not only is the stock complex but one often feels unsure about how to go about asking if they have the right part, Prestel could play a very useful role. I could imagine Halfords branches, for example, with Prestel sets (on a closed user basis) with details of the full range of their products,

prices and stock and a tracing service to find the particular bit for your car, overcoming the vaguaries of model, year, part, part no. and so on.

A further expansion of the goodwill generated by offering a Prestel facility in your outlet is to offer the Prestel facility with some special information, available only if using Prestel within that outlet. This would reflect even more directly on the benefit of the outlet itself. Here one could imagine a chain of garages offering, not only the general Prestel facility in the garages, but closed user information on forward traffic conditions, so it would thus become known that every time you stopped for Blogg's petrol, you would be able to get quick and up-to-date information on forward traffic conditions for wherever your journey was likely to take you.

Moving away from the sets and back to the data contained on Prestel, we will undoubtedly see bribery used to gain readership of particular pages. This is, of course, already used in many other media, perhaps at its mildest in the Times at Christmas when you search through the personal column and complete a competition entry which gives you the chance of winning some prizes. Because of the lack of casual readership on Prestel, it is even more likely that we are going to see financial inducement to readers looking at specific pages -'if you look at my pages you will get a chance of winning a holiday for two in Bermuda' might really become quite common.

A third area under this heading depends on pretty wide coverage of the residential market, (so this will take some time to come), but I can see Prestel playing a part in general advertiser competitions where the competition is set on Prestel and you have a chance of a prize if you answer the questions correctly. This you would do by feeding answers back into the set, but to answer the questions you would need to have bought the advertiser's product as the clues would be on the pack. Here the interactive nature of Prestel will give the advertiser the chance to get that immediacy of result that he so craves.

I would like to consider the area of advertising on Prestel that most excites me, and which could eventually become the largest single mode by which advertisers will enter the system. I suggest that the main thrust in the long term will be via the sponsorship of information. I imagine that this would start by advertising sponsors coming together with IPs so that the advertiser was gaining more than a base line mention on a particular page and the IP was gaining more than just the revenue that would come from such a small advertisement. Under this scheme the IPs information would appear to have been provided by the sponsor. We could have Schweppes providing the cricket results; Player's details of the motor racing facilities; Encyclopaedia Britannica with information for children and so on.

This would be more valuable to the advertiser than mere lineage because of the general goodwill that involvement with that particular sport or data would generate. The advertiser would presumably bring to bear the same criteria in judging the worth of his involvement as he would to sponsorship in other fields. It would provide useful revenue to the IPs allowing them to develop their services, and allow them to make a respectable living in the difficult early days. I would have thought the value to the advertiser of this sort of advertising on Prestel would be much greater on the whole for general advertisers than those other modes considered earlier. It is also a relevant adaptation of advertising to the nature of this particular medium rather than just a straight transferance from more traditional media of unsuitable advertising formats. This is already beginning in the Amex City Guides, and the B.A. airline timetables. There is a danger in all this to IPs arising out of either a resistance by IPs to this sort of advertising or because of the inadequacy of data in some areas or just because the advertisers want to control the data themselves. As a result the sponsors will come on to the system offering their own independent data in some areas that rivals the IP's existing data and is able to undercut their prices considerably, as a sponsor is seeking to derive revenue not from the use of the page but the goodwill transferred on to their product and their sales. This would be very unfortunate as it would force IPs off the system and lower the tone of everything that appeared on Prestel if it became predominantly sponsored information - I do not think this will happen - perhaps a partnership will develop between IPs and advertisers over the years to their mutual benefit. There may be some invention of data by advertisers but of the sort that IPs would not particularly wish to be involved in. One can imagine food companies offering recipe services - a considerably more

appropriate form of advertising in this medium than in some others; Kraft have recently been running a whole series of recipe ads on the radio and in the press which, because of their day-to-day changes of suggestions, would be ideally suited to Prestel. A whole range of food advertisers like this could use Prestel in different ways - British Meat running a series on the day's best buys and so on. So I see a partnership with advertisers sponsoring IP provided information and advertisers generating information of their own appearing under their names.

A third and last area under sponsorship I have called 'sneaky'. This would be the provision of information to solve problems where the solution is actually the advertiser's product. I do not think that it really is very sneaky although there is a degree of cunning on the part of the advertiser to develop a scheme. What I have in mind here is, for instance, a chain of motoring stores sponsoring a car fault tracing service where the motorist can call up a check list and then fill in replies to questions to find what the fault is on his car and be told how to go about fixing it, what replacement part is necessary and at what price it is available, at the nearest one of the chain stores. It isa sort of teaching machine use which could apply in a whole range of areas where the potential buyer needs help - car servicing, do-it-yourself, insurance problems, and so on.

In summary I feel that advertising should be encouraged on Viewdata as it will bring a commercial vibrancy and innovation as well as money. I think it will also bring a responsiveness to consumer needs and a flow of information about the way the consumer uses the system and would like to use the system that will be helpful to everyone involved. I imagine that a whole series of brokerages will spring up; we already have the umbrella IPs involved in advertising and encouraging its growth but I think some other small companies will probably be set up with the sole purpose of the encouragement of advertising on the system and the provision of some technical services.

I fear that advertising agencies may be slow to get involved. The history of new media in this country illustrates the caution the agencies bring to unproven (and often initially relatively expensive) media. The problem may be compounded with Viewdata as the advertising will involve very different skills from those available in agencies currently and yet the likely available revenue in the early days will be too small to justify the necessary investment. The Umbrella IPs will take the brunt of the technical and creative development, the

agencies providing the client introductions and inclusion in the media plan. It is difficult to see how such a slight involvement could justify 15% other than in the short term, so at some stage the Agency industry is going to have to decide whether to learn about Viewdata and develop creative skills in the area to justify their commission, or to hand over this whole area to the specialists. I hope agencies will take up the challenge, particularly as this new advertising opportunity is likely to be new money. (There is no doubt that commercial T.V.'s arrival enormously boosted advertising expenditure by providing a new possibility for building sales. Prestel is likely to do this more than ever).

I think brokers will be inventing packages to sell to potential advertisers, that is they will generate data that they think would find an audience but will also be appropriate to particular advertisers. There are many areas where one could imagine that this might happen, from gathering price check lists in grocery stores in a particular area through to lists of doctors and dentists with capacity within their lists in an area, to one that I would personally like to profit from which would be the gathering together of a list of garages and the times they are open in times of petrol shortage. The provision of these skills will be very helpful to the development of Prestel itself, I believe, as it will involve the development of further ways of using Prestel unique to the system, thus helping to bring more people into Prestel and get more use of Prestel by those who already have sets.

Advertising on Prestel is unlikely to make a major hole in a large advertiser's budget and a few pages for a small advertiser via an umbrella IP would only be a few hundred pounds.

The cost effectiveness of the media is, of course, the deriding factor in its inclusion on media schedules. What the costs per thousand will be is more or less anyone's guess. For what it is worth, we have done some calculations based on three assumptions: that a page costs £20 per annum; that the average (residential) number of viewing minutes per week will be 15, and that the average reading time per page will be 10 seconds, giving 4680 pages per set per annum. Business users would be many times this level.

If these assumptions were correct, then in a universe of ½ million pages and 250,000 sets placed, the cost per thousand would be £8.55. On ¼ million pages and 1 million sets it would be £1.07; on ¼ million sets and 1 million pages it would be £17.09. Something around the £8/£9 mark seems most likely. If this were reality it would be pretty reasonable. While about twice TV costs, we will be talking about a much more targetted audience, more likely and able to convert advertising to a sale there and then, so these prices would represent good value. Of course it all depends on the degree of usage, number of sets, number of pages and charges to be on the system. All unknowns upping the number of sets estimated to 3/4 million would produce a cpt below that for a 30 second TV commercial.

What we will all need as soon as possible is data. Who is using, how often, in what way, with what result. The Post Office will be able to supply much of this from the computer access information, but it is to be hoped that Prestel will get into the industry meter measurements as the coverage of sets becomes significant. Not only will this be important in the provision of data itself, it will also have an enormous value in placing Prestel alongside T.V. and forcing it more on the attention of agency media buyers as a serious contender.

Summary

Prestel offers the unique advantages to advertisers of an interested audience and the facility to be entirely up to date.

This is a problem as well as an opportunity, as, traditionally, advertising is devised to attract the attention of an uninterested passing traffic and need not change copy with any great frequency. To exploit the potential of Prestel to the full, the advertising industry will need to adapt and learn new skills.

The advertising opportunity on Prestel is to devise information that the audience will seek out, which, at the same time, will benefit the advertiser's business whether by association (as with sponsorship) or more directly (as with catalogue listings). Those prepared to invest in experimentation in the early days when audiences are still small will be equipped to reap the benefit when Prestel becomes commonplace in business and in homes.

VIDEOTEX STANDARDIZATION

A FRENCH VIEWPOINT

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This paper comments on the situation on international standardization. Videotex has been introduced within the CCITT since May 1978 but more than two years of work are included in the draft ISO standards, draft CCITT recommendations and CEPT documents. The state of these documents is briefly analysed in the light of the French context.

1. THE CONTEXT

The standardization process for Videotex service and system started very late. The Viewdata system was already implemented and the corresponding service, called Prestel, ready to be publicly open; the corresponding broadcast service (Teletext) was already a public service, a broadcast Antiope public service for stock exchange information was just one year old and the corresponding interactive Antiope system was under test when on the 8th and 9th May 1978, the CCITT proposed to introduce new questions in SG1 and SG VIII. The CEPT had started slightly sooner within the Data Communication/ Subscriber Equipment subgroup. Roughly at the same time, at the end of May 1978, the ISO Technical Committee 97 Subcommittee 2 opened a working group (WG4) to study the coded character set for text communication services; although primarily intended for Teletex types of services, i.e. services which produce a printed paper output, ISO group took the important decision to include Videotex in the terms of reference of WG4.

The goal was to obtain internationally agreed texts before the CCITT plenary next June - two years work.

That situation gave rise to a series of difficulties, which appear in the quality of the documents produced.

The first difficulty was due to the British situation and its position may be summarised as follows: "We have a system, terminals and we want it to be internationally legalized as it is". This position paralysed the discussion as any proposal was rejected if it was not completely compatible with Viewdata. A compromise proposal could have found complete support in Europe in early 1978. It has been rejected by the UK not because it was unacceptable for Prestel's Viewdata but because it created difficulties in exporting Teletext. At that time, the coding of Viewdata and of Antiope differed only by the use of the space character!!! Then, CEPT work lead to more significant differences appearing between the "CEPT modified Antiope" supported by 6 administrations and the UK's Viewdata. The good will of all negotiators has been an absolute necessity to avoid a complete deadlock in the discussions.

The second problem was the haste and thus the density of meetings. Due to the fact that some discussions on Videotex and others on Teletex had influence on each other, the following groups were considered

CCITT SG1 plenary and Videotex WG (and occasionally the Teletex RG)
SG VIII plenary, Videotex and Teletex terminal groups

ISO TC 97 SC2 WG4

CEPT SF/SFT and CD/SE

In addition, a CCIR/CCITT co-ordinating group has been set up and fortunately has not met yet. There are also meetings of EBU V2 group. There are between 8 and 10 groups, each of them having from 1 to 4 meetings a year. Taking into account the delay in preparing and distributing working documents, in the latest meetings, 99% of the working documents were distributed during the meetings. Sub-drafting groups were created in addition, which met several times, working at night or during the week-end where necessary. It would be a miracle if such working conditions could give rise to a document without omissions or technical error. In addition, the continuous presence of experts at these meetings made them more or less lose part of their contact with the technical services where the proposed solutions are tested. These tests require some time and "MTBM" (mean time between meetings) becomes too short for effective technical work. Some of the technical or service requirements (it is the case e.g. for DRCS) have been proposed, defined and adopted only on paper. It is thus clear that the international experts are all geniuses!!

It is probably the reason why there is at least one happy result of this situation: a French proverb says "Les grands esprits se recontrent". The fact is that the experts who took part in so many meetings in so many places began to form a real community and, although discussions have been hard and sometimes violent, real friendships arose among people mandated to be known to be irreconcilable opponents. A sensible annex to draft S and F Videotex recommendations could well be a study of international gastronomy as seen by the different organisations which hosted our meetings. In this respect, no doubt the Deutche Bundespost has received special mention since the Munich meetings of June 1978.

3. THE RESULTS

Surprisingly, results have been obtained. Three very important documents, although still provisional, have been published: draft F.b CCITT recommendation defines service requirements, draft S.g CCITT recommendation defines the coded information to be exchanged, draft proposal for an international standard 6937 defines a repertoire and its coded representation. But these documents are not complete and the difficulties are accentuated by the number of bodies involved, the timing of their meetings or period being different, thus making the necessary co-ordination very difficult.

Just a short anecdote to recall how the decision was taken to code the accents into one column of the code table instead of two. The origin was in international standard 5426 for exchange of bibliographic information, recognising some 30 different diacritical signs, most of them being used for transliterations of African or Asiatic languages. The idea came into teletex and then into videotex to use a version of this standard. The number of accents

used for teletex and videotex have been reduced to 13, but the coded representations have been kept from the original document. Other signs have been changed. At last, a videotex CCITT group expert wrote to the teletex rapporteurs group to make the request to concentrate the 13 codes into a column of 16 places and to make the other column free for other applications e.g. for supplementary picture element symbols. A copy of this letter was also sent to ISO. One month later, the teletex group answered - no, ISO requires the accents to be in two columns. An ISO meeting held 6 weeks after the teletex group, gave a positive answer to this question. A further meeting of the videotex working party urged teletex people to modify their position and, finally, more than four months after the request, the result was obtained.

A lot of problems of that kind remain in present documents. Some are of detail, others, as is the case for control functions and protocols, are of substance. The paragraph devoted to control protocols in Sg is substantially empty.

It is not a criticism towards the authors of the document (of which we are a part) to recognise that, as they are, the documents are almost unusable as such by naive readers to implement a service and to design equipment. A good knowledge of the background is necessary and the contributors did undoubtedly become valuable people whose advice was requested at night as well as in the daytime for detailed explanations. In addition there was frequent travel which did not delight research engineers who were used to a quiet life. If not the best possible technically, the result obtained has been the best that could be negotiated: The British, the French and the Canadians have found a nest for their chickens which all lie together side by side in a comfortable S draft recommendation.

Therefore, the main benefits resulting have to be looked for elsewhere, notably in the number of problems raised during the discussions, in the number of ideas exchanged between experts from so many different countries. The number of concepts born out of the confrontation during the meetings may provide work for a hundred engineers or technicians during the next five years. At a time when unemployment is one of the seven deadly sins of the world, this is not completely negative. More seriously speaking, we may believe that, if you now take all the experts who took part in these meetings, shut them in a locked room, fed them through a hole in the wall, and let them cook slowly for three weeks, after that time, white smoke would appear and the result would be a good standard, really implementable. Just prevent politicians and investors having a place in that room.

TO CONCLUDE

It is not correct to say that there is yet a videotex standard, therefore the title of this session is somewhat optimistic, or premature. No doubt, there will be such a standard some day: all the structures are now in place to make it. There will also be videotex services. The only question is that they may well not conform to the standard. That is another question.

Towards Videotex Standards *

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Videotex is a generic name for a class of information services based on a modified home TV set with a keypad for user feedback. While present system designs center around a page-oriented database for information retrieval of interest to the general public, future videotex systems will probably evolve towards a generalized information utility with innumerable applications. In order to enable orderly growth of videotex technology, a framework of standards and conventions is needed. This paper attempts to identify the functions in videotex systems, for which standard communication protocols will be needed. These functions are discussed on the background of the ISO reference model for Open Systems Interworking.

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1 - INTRODUCTION

Videotex is the generic name for a class of information services based on a modified home TV set with a keypad for user feedback. This terminal is connected through various transmission media to a computer providing the necessary processing and database services. The most often used transmission channels in today's systems are telephone lines and TV transmission.

Two broad categories of systems can be recognized:
(a) One-way systems, where interaction exists only between the user (keypad) and the terminal, and
(b) two-way systems with full interaction between the user and the service computer. Except for the limitation of the usual keypad (which can be easily overcome), there is little difference between the potential of such interactive videotex systems and any general purpose computer system. The actual difference is that videotex is intended to cater to the general public; therefore its initial cost and complexity should be acceptable to the non- expert users. As a result, the initial application chosen in practically all systems is retrieval of information of general interest from public, page oriented databases. However, it should be kept in mind that in the future videotex will probably evolve towards a generalized information utility with innumerable and sometimes unforseeable applications.
Functional and technical descriptions of many present systems are available in the literature [1,2].

It can be seen that videotex technology involves a large number of interworking components such as terminals, TV sets, telephone networks, national and international data networks, computers and databases. These components are designed, manufactured and operated by many organizations. In order to enable orderly growth of videotex technology, a framework of standards and conventions must be provided. Some recent proposals in this direction are e.g. for a terminal-independent scheme of information coding [1], and for layered terminal capabilities [3].

The present paper is an attempt to identify the functions of a videotex system, for which standard protocols will be eventually desirable. Some of these protocols should be standardized soon, while other functions are not yet well understood at the present. We take the ISO model for Open Systems [4] as a reference for our discussion.

2 - THE ISO REFERENCE MODEL FOR OPEN SYSTEMS

The subcommittee SC 16 of ISO TC 97 has defined a standard reference model [4] for the architecture of systems that are "open" for interworking with other systems in a distributed environment. The model distinguishes several layers of communication protocols. The functions provided by the different layers may be characterized as follows:

(1) Physical layer: transmission of unstructured bit sequences.
(2) Link layer: control of logical links between systems components, data transmission with error recovery.
(3) Network layer: routing through networks, circuit switching, virtual packet-switched circuits.
(4) Transport layer: logical connections between processes in different computers, uniform data transport service independent of the underlying physical transmission medium.
(5) Session layer: control of sessions over logical connections.
(6) Presentation layer: representation and coding of data structures, such as characters, display formats, etc.
(7) Application layer: "applications" using the services provided by lower layers, distributed system management such as collecting statistics on traffic, reporting of failures, etc.

While the lower layers of the architecture are relatively well understood and exemplified by existing communication protocol standards, the higher levels are presently under study for the development of international protocol standards. Among these standards being developed, the Virtual Terminal protocol is closely related to the videotex terminal functions discussed below.

3 - PROTOCOL FUNCTIONS FOR VIDEOTEX APPLICATIONS

We give in this section a preliminary list of functions that must be handled by the database system through interaction with the terminals, other database systems, and possibly administrative entities. These interactions are governed by appropriate communication protocols. We explain each function, and indicate in which layer of the ISO reference model it would probably reside. If appropriate we also mention existing protocols that may be used for these functions in the videotex framework. It is clearly very important, in adopting standards for the present simple videotex applications, to avoid the dangers of early standardization [3], and ensure upward compatibility with future more sophisticated applications.

Most of the protocol functions mentioned below involve the database system and the user's terminal. It is important to note that, depending on the intelligence of the terminal, many of these protocols may operate between the database on one side, and the terminal (or the user) on the other side, or between the terminal and user.

As an example, consider browsing through classified car ads in order to find a used Datsun car. With a simple terminal, the user will sequentially read through the ads, giving signals to proceed through the data. A terminal with plug-in intelligence might perform a "Datsun" keyword search for the user, searching automatically through the car ads data segment and displaying only the relevant ads. Alternatively, the same intelligence may be down-line loaded from the database to the terminal, if the latter has telesoftware [7] capability. Apart from the telesoftware protocol, the database system executes in all cases a simple browsing protocol interacting with the user, or terminal. In the case of intelligent terminals, a keyword search protocol (defined as a sequence of user commands and system responses) specific to the plug-in intelligence or telesoftware is executed between the user and the terminal. Such a keyword search protocol may also be executed directly between a user and database if the latter supports such a facility. Only a simple terminal with character feedback would be needed.

3.1 - Data transmission and session control

The functions described below must be supported by an appropriate data transport and session control service between the database and the other system components, especially the terminals. These functions are provided by the Session layer of the ISO model and the layers below. We do not discuss these functions here.

3.2 - Protocols for terminal operation

The following functions are part of what might be called a videotex virtual terminal, and belong mostly to the presentation layer of the ISO model.

3.2.1 - Display control

There are two aspects of data display that must be controlled: (a) the structure of displayed data, and (b) the temporal order in which parts of an information segment are displayed (in simple systems this order is page by page).

For transmission, the data to be displayed must be coded. Compactness and independence from terminal display characteristics

are important objectives for the choice of appropriate coding schemes. Depending on the type of information, different schemes may be used, such as the following:
For textual information:
- standard ASCII character set
- ISO code extentions (e.g. for alpha-mosaic drawings)
- display format controls (e.g. for tables, annotation of diagrams)
For graphical information with gray scale and colors:
- Telidon PDI [1]
- ACM graphics standard [6]
For photographic information:
- Telidon PDI
- facsimile
For voice information:
- PCM
- compressed voice
For video imagery (moving images):
- analog storage and/or transmission may be used, which lead to a hybrid system (analog for video and digital for data and control).

All these coding schemes belong to the presentation layer of the ISO model.

Another aspect is the temporal order in which different parts of an information segment may be displayed. We distinguish the following cases:
(a) Simultaneous display of the whole segment as a whole page.
(b) Sequential display if the segment contains several pages. Roll mode (suitable for general text information) and page mode (for information organized as a sequence of display pages) are available.
(c) Incremental display, where elements are added to an evolving picture.
(d) Interactive selection of complex display sequences, such as in the case of interactive manuals, courses, etc.

3.2.2 - Telesoftware [7]

This function provides the possibility of loading programs and data into the terminal and initiating the execution.

3.2.3 - User feedback

Retrieval applications usually involve at least numerical and special function feedback from a simple keypad. More sophisticated applications may involve text (from an alphanumeric keypad) and possibly some graphic interaction (with a joystick or mouse).

3.2.4 - Option negotiation

Option negotiation is the process of selecting the facilities and protocols that are to be used during a subsequent communication session. The negotiated facilities and protocols will depend on the application to be performed and on the capabilities of the involved terminal and database. They may include different display types, telesoftware and feedback options to be used, particular selection functions (see below) to be provided by the database, and the physical limits of the terminal such as screen size, graphical capabilities, memory size for telesoftware, etc. A possible protocol scheme for negotiation is described in [8].

3.3 - Information retrieval

The database structure determines the procedures by which a user may retrieve information on the terminal (part of the ISO presentation layer). Retrieval involves user feedback and different selection functions available in the database. Present videotex databases usually have a tree-like structure, where each node of the tree contains an information segment which itself may consist of a number of displayable pages. The so-far implemented selection functions include the following:

(a) Direct selection of a data segment or page by a user-given numerical identifier.

(b) Multiple choice procedures, where the user responds to a displayed "menu" by choosing from a fixed set of alternatives.

These functions involve only segment and page identifiers, but not the information content of pages.

More powerful selection procedures are desirable for future applications, such as:

(c) Keyword searches (a possible protocol is described in [9]).

(d) General queries in formatted files and databases (a screen oriented query language is described in [10]; different approaches to the use of natural language are discussed in [11]).

These selection procedures involve the content of data segments, and usually require more processing in the database computer. A more detailed discussion of possible database structures and selection procedures for videotex may be found in [12].

3.4 - Cooperation between databases

Future videotex systems will probably include different databases cooperating in a varying degree. In one extreme, they may be separate independent databases; in the other extreme, they logically represent a single database, as seen by the user. We assume here that several databases cooperate in order to present to the user a data structure which makes largely abstraction from the physical

distribution of the data. The different databases may contain different sets of specialized information, or possibly multiple copies of the same data.

An example is given in figure 1, which shows a global directory as seen by the user, involving data in different databases. The upper part of the directory information may be replicated in several local videotex service computers, while the provincial and corporate information may only exist in one copy. The example also shows how different views of the data may be obtained depending on user's viewpoints. Through the "public DB" access point, the only accessible data about "NT" is the "NT overview" and its subtree, while other information, such as "personnel" is visible through the "NT corporate DB" access point.

Cooperation, as in this example, clearly requires certain similarities and communication standards between the databases involved. At the present it is not clear, what kind and how much cooperation would be useful and feasible for videotex applications. Nevertheless, we may identify the following functions, which may be allocated to the ISO application layer.

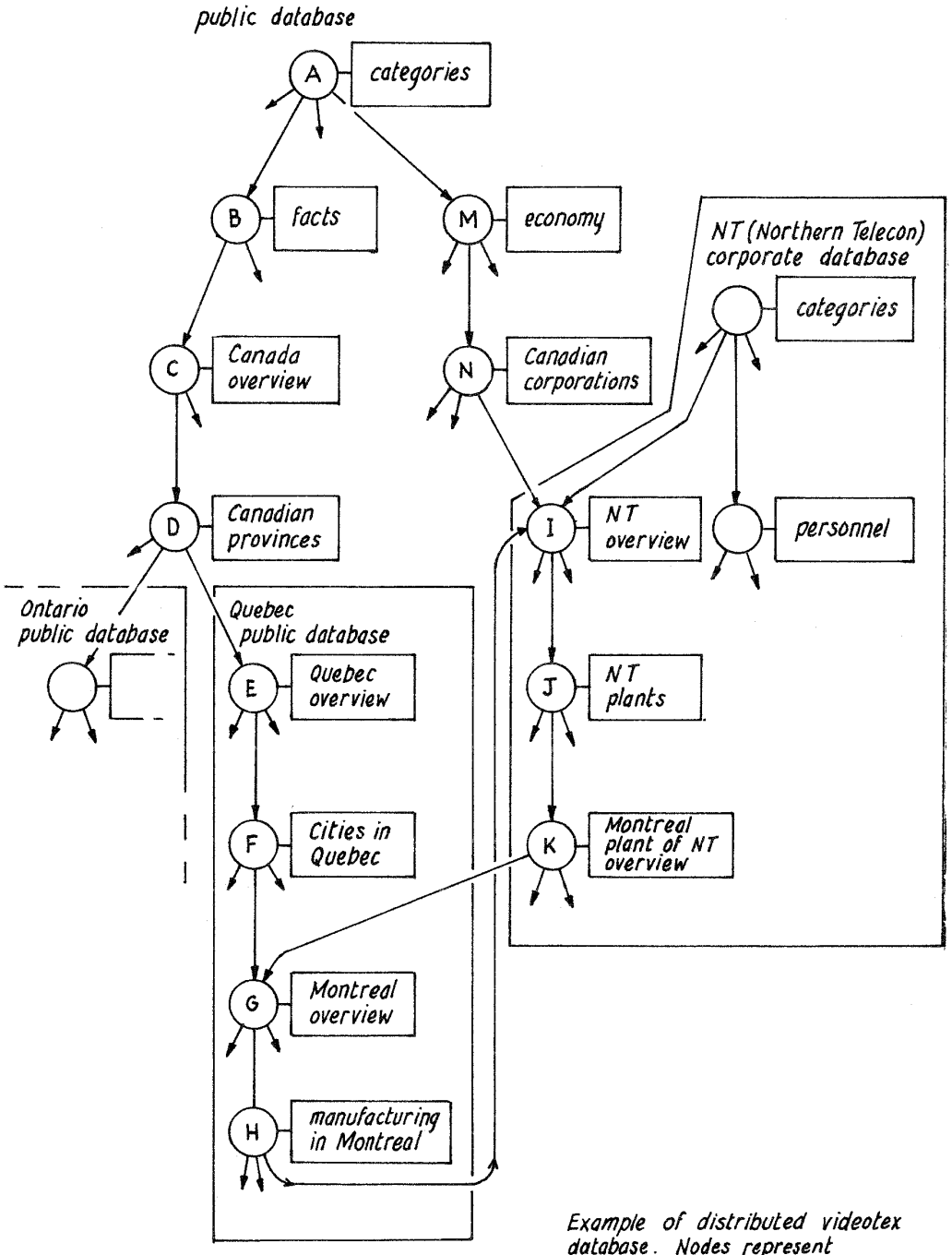
3.4.1 - Cooperation for retrieval

Database cooperation may include the following functions for making information retrieval more efficient and/or simpler for the user:

(a) Forwarding: a segment or page requested by the user may not exist in the local service computer; it may be forwarded on demand from another database.
(b) Local copies: It is advantageous for efficiency to keep local copies of frequently accessed pages.
(c) Superdirectory: A directory of all available databases and other services may help to transfer the user directly to the chosen service computer.
(d) Global directory: As shown in the example of figure 1, cooperation of different databases may lead to a single global directory, as seen by the user.
(e) Multiple views: As in the example, different access points may give the user different (partial) views of the stored data.

3.4.2 - Updates

Database updates involve the following two phases: (a) the creation or update of a segment, and (b) its incorporation or deletion into (from) the database, with a corresponding simultaneous update of the directory. Phase (a) will usually be executed by an editor (terminal) which may obtain an existing segment through a forwarding protocol. Phase (b) presents the problem of keeping the



Example of distributed videotex database. Nodes represent information segments; branches from a segment correspond to multiple choices.

database directory consistent with the available information segments. Directory structures such as in figure 1 are certainly not easy to keep consistent because of the many possible relations between segments. These consistency problems become even larger if global directories for several databases are involved.

An important function of the update protocol in cooperating databases is thus to keep the directories consistent with one another. The protocol will depend on the database structures used and their cooperation, and on the degree of consistency required.

3.5 - Distributed system management

Here we consider protocols for the following functions, which might be allocated to the ISO application layer:

(a) User identification: This function is needed to verify access rights (except for public databases), and for charging.

(b) Verification of access rights: (not needed for public databases).

(c) Charging: We can identify the following groups, companies or administrations involved in the operation of videotex systems: the user, the terminal provider, the transmission provider, the database administration and the information provider. Usually the user, and sometimes the information provider (e.g. in advertizing) will pay for the services provided for him by others. Simple protocols must be provided to automatically execute the appropriate financial transactions. Third party billing schemes are essential, see e.g. [13].

(d) Data distribution: This involves operating, monitoring and controlling updates in distributed databases and the management of global directories.

3.6 - User support and help facilities

A friendly user interface is important for the acceptance of videotex services by casual users. The procedures for getting information about how to use the services should, as far as possible, be the same for all services [9]. Such procedures should include

(a) a general HELP command,

(b) getting a list of available commands and their meaning,

(c) getting an explanation of each command, its function, and eventually examples of its use,

(d) interactive choice of parameter values with prompting the name of the next parameter, etc.

As an example, many of the above functions are implemented in the UNIX operating system [14].

REFERENCES

1. H.G. Bown et al.,"Telidon: A New Approach to Videotex System Design", IEEE Trans. on Consumer Electronics, Vol. CE-25, No 3 July 1979, p. 256.
2. R. D. Bright, "Prestel, the World's First Viewdata Service", ibid. , p.251.
3. J. M. Costa and A. H. Marsh, "Videotex System Planning", Proc. National Electronics Conference, Chicago, Oct. 1979, p.337.
4. ISO, TC97/SC16 N 227, "Reference Model for Open Systems Architecture", June 1979.
5. J.C. Smirle and H. Bown, "New Systems Concepts and their Implications for the User", Proc. First CCITT Symp. on New Telecommunications Services, Geneva, May 14-16 1979, p. 128.
6. J.C. Michener and A. Van Dam, "A Functonal Overview of the Core System with Glossary", ACM Computing Surveys 10, 4, Dec. 1978, p. 381 (and other articles in the same issue).
7. J. Hedger, "Telesoftware", Wireless World, Nov. 1978.
8. IFIP WG 6.1, "Proposal for a Standard Virtual Terminal Protocol", INWG Prot. Note 91, Febr. 1978.
9. A.E. Negus, "Euronet Guideline: Standard Commands for Retrieval Systems" (report for the Commission of European Communities DGXIII), Dec. 1977, INSPEC, Savoy Place, London, WC2R OBL, England.
10. 'Query by example', see for example in C.J.Date, An Introduction to Database Systems, Addison-Wesley,1977.
11. D.L. Waltz, "Natural Language Interfaces", ACM Sigart Newsletter 61, Febr. 1977, p.16.
12. J Gecsei and G.v. Bochmann, "Database Structures in Videotex Applications", submitted to IFIP Congress 1980, Tokyo.
13. I. de Sola Pool, "International Aspects of Computer Communications", Telecommunications Policy 1,1, Dec. 1976, p. 31.
14. D.M. Ritchie and K. Thompson, "The UNIX Timesharing System", Comm. ACM, 17, 7, July 1977, p. 365. 9^ d 4740 r 200 /open/open/ 1 200 1 200 L 200 d 30 80

Future Utilization of Interactive and Broadcast Videotex in Germany and its Effects on Standardization

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1. Broadcast Videotex in Germany
2. Interactive Videotex in Germany
3. Necessary Improvements for Interactive Videotex
4. Data Transmission Methods
5. Common Use of Hardware Components of the Subscriber's Unit for both Interactive and Broadcast Services.

1. BROADCAST VIDEOTEX IN GERMANY

Broadcast Videotex is a pure distribution service for information which does not permit any interaction between subscribers and the broadcast centre. Using two lines in the blanking interval of the TV frame only about 80 coded Videotex frames can be cyclically transmitted in an acceptable access time. Therefore and for media-political reasons in the Federal Republic of Germany, broadcast Videotex will mainly be used for information related to TV programmes, such as fading in subtitles in several languages (including German for people with hearing defects), for programme previews, short versions of recently reported events for 'late comers', and for summaries and actual supplements of news telecasts of any kind.

The relatively low number of pages and a central information input for each TV programme will suffice for this purpose. Special graphic symbols and complex picture configurations can possibly be omitted, but a very high number of different characters used in various foreign languages, and switching possibilities between these languages are absolutely necessary for subtitling as a service for the large alien population in Germany.

Assuming the normal TV viewing distance, subtitle letters should be displayed in double height and double width. Using the British standard only 20 characters per line could be displayed. Therefore it is proposed to increase the number of character positions per line.

2. INTERACTIVE VIDEOTEX IN GERMANY

In the current year the German Federal Post Administration carries out a field trial with a few thousand Videotex subscribers in the Düsseldorf area using the nearly unmodified terminal hardware of the British system but enlarged with connections between the Postal Videotex centre and so-called external computers. This field trial system is called an obsolete solution" and will no longer be used for the service introduction in 1982, since it restricts a great number of planned possibilities of use.

In Germany interactive Videotex is seen as a technology not only for individual access to prepared and stored text pages but also for all kinds of data communication in private and commercial applications like reservation, booking, and order entry services, computer-aided education and special-purpose computing and administrative services. These planned possibilities of use can be realised by connecting the Videotex centres to external computers and to other data communication networks like Telex and Teletex, and by the introduction of some dialogue and display improvements. These improvements become necessary because the successful introduction of interactive Videotex will depend on

- low cost, only possible with large numbers of subscriber's units
- interesting services
- improved picture presentation and dialogue design
- simple use of terminals and good workstations for information providers
- acceptable reaction and transmission times.

3. NECESSARY IMPROVEMENTS FOR INTERACTIVE VIDEOTEX

Among the most necessary improvements is an enlargement of the character sets to

about
- 90 standard characters (G0 set)
- 30 national characters, e.g. ß
- 200 accented letters, e.g. Ä, ä, Ö, ö, Ü, ü, é, è
- 50 international symbols, e.g. °, ², ³, µ, $, ±
- 64 mosaic graphic symbols + 32 adjacent line graphic symbols
- 1 set of down loadable characters, e.g. for individually defined symbols, and for composition of high resolution line drawings.

This and the demand for parallel exchange of attributes (e.g. colour, flashing, inverting) can only be realised by increasing the memory in the subscriber's terminal to 16 bits per character position.

Since the character set shall include accented capital letters and underlining, the vertical character spacing should be enlarged. Figure 1, left shows the British character spacing of 10 TV lines; fig. 1, centre shows an optimal spacing with 3 further TV lines for accents and one additional line for underlining. Figure 1, right shows a possible compromise using 12 TV lines and therefore allowing the display of 20 text rows (plus 1 row for service messages).

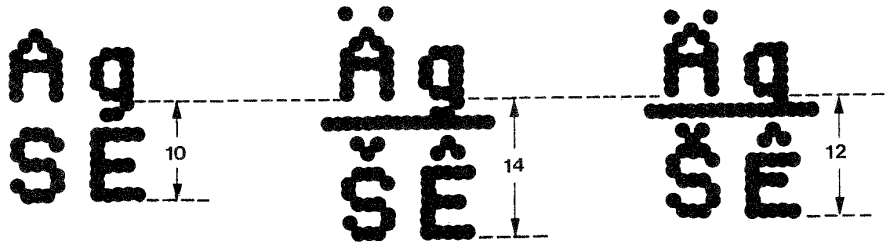

Fig. 1 Necessary line spacings as a function of the character set and acceptable deformations

Displaying upright rectangular character forms and in accordance to the above-mentioned demands in broadcast Videotex subtitling the number of character positions per line can be increased to 48, so that 20 rows by 48 characters give the same total number of characters as in the British system.

Further extensions include the connection of peripheral devices like alphanumeric keyboards, memories for display contents and programmes, hardcopy units and ticket printers, and addressable video discs.

Future developments include the animation of pictures, e.g. by flashing of single characters, by temporary suppression of parts of the picture and by moving or exchanging of symbols or graphic sections. This is possible employing a philosophy where a picture is composed of several display levels of different priority comparable to the generation of animated cartoon films. So the first level (with highest priority) is the level of normal Videotex character foreground. The second level concerns the individual background colours, the

third level the background of character sequences, the next levels concern additional high resolution graphics, and the last level can be the picture background colour or a TV picture. Each level can be occupied by picture parts or can be transparent for displaying the level underneath. Fig. 2 shows an example including a continuously movable graphic figure.

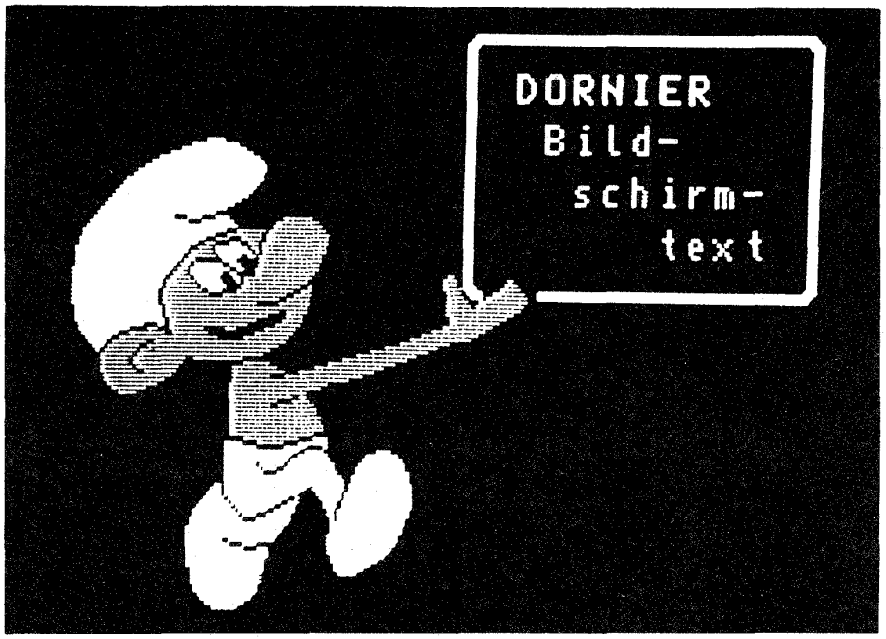

Fig. 2 Image with Videotex characters, additional adjacent line graphic symbols, and a graphic figure transmitted by dots

4. DATA TRANSMISSION METHODS

Until now the standardization of data transmission for interactive Videotex was the main task of various committees based on the 7 bit code according to ISO 646 together with the code extension principles described in ISO 2022. Several proposals have been discussed, the two most suitable of which appear to be a multi-page method and a composition method.

The multipage method uses national character sets for all letters of a language or a group of languages and all punctuation marks joining the letters without space in between. Fig. 3, left shows an example for French language. This method is also appropriate for broadcast Videotex using only 8 bits per character and shift control codes for shifting between different character sets.

The composition method uses a modified IRV as a GO set and a second character set G2. Fig. 3, centre shows a German proposal for this set with international symbols in column 2, 3 and 5, with special national letters in column 6 and 7, and with diacritical marks in column 4 for the composition of accented letters. Fig. 3, right shows a modified G1 set including the 64 mosaic graphic symbols and 32 adjacent line graphic symbols.

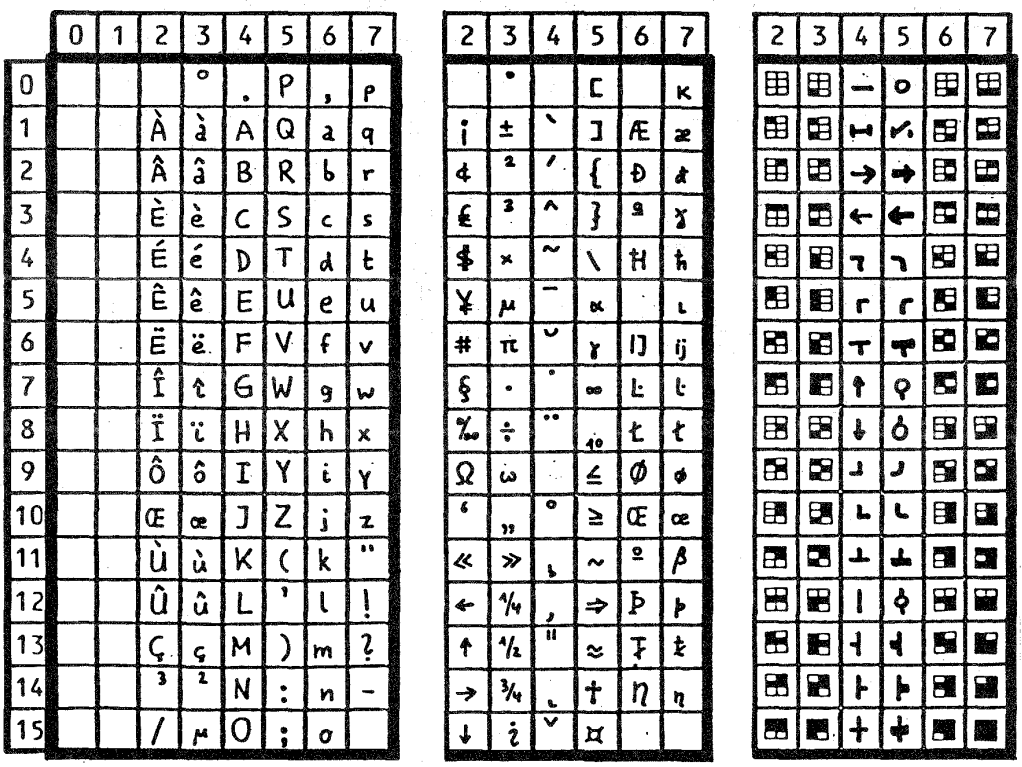

Fig. 3 Examples of character sets, left a national French set for the multi-page method, centre a proposed G2 set for the composition method, right a modified G1 set for mosaic graphics and adjacent line graphics.

5. COMMON USE OF HARDWARE COMPONENTS OF THE SUBSCRIBER's UNIT FOR BOTH INTERACTIVE AND BROADCAST SERVICES

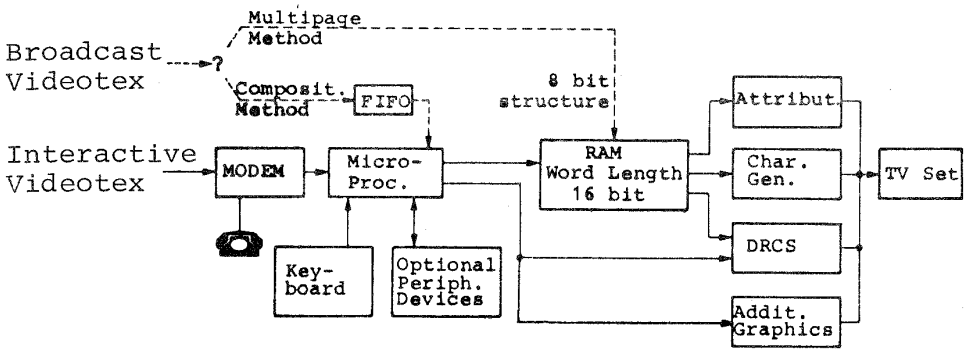

Fig. 4 Hardware components of the subscriber's unit

Fig. 4 shows the hardware components of a subscriber's unit including a MODEM, a microprocessor, refresh memory and character generators for interactive Videotex. The dotted lines show the supplements required for additional utilization of Broadcast Videotex. If the present British Teletext mode is chosen the multipage method described above is proposed. Here 8 bit words are stored into the refresh memory.

Otherwise data can be transmitted with a composition method as in interactive Videotex. In this case a FIFO memory serves for the adaptation of the data transmission rate to the microprocessor processing speed.

6. REFERENCES

Zimmermann, R.: Problems of international standardization of Videotexservices. Displays, July 1979, p. 103 - 109.

INTERNATIONAL VIDEOTEX STANDARDIZATION:

A CANADIAN VIEW OF PROGRESS TOWARDS THE WIRED WORLD

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CANADA

This paper examines the status of international standardization for interactive Videotex and presents a possible scenario for international interworking between dissimilar systems. Background to Canada's decision to standardize on an alpha-geometric/photographic system for videotex field trials is provided, together with some observations on its implications for the choice of systems standards by countries proposing to offer videotex services.

Introduction

Since the first appearance of the videotex concept in the CCITT at the meetings of Study Groups I and VIII in the spring of 1978, the international standards scene has been characterized by frenzied activity on the part of countries desirous of obtaining international standards recognition for their national systems and technologies. The debate has been long and sometimes heated, with the negotiating positions usually starting with the statement: "If only everyone would adopt my standards, we would not have a problem!" To the surprise of many observers (and participants) however, the final product, in the form of draft CCITT Recommendations Fb and Sc, now seems to promise to be a greater unifying force than it has appeared, in that it goes beyond national differences, pointing the way not only to a medium-term situation wherein international interworking between dissimilar systems should be possible, but hopefully also to a long-term convergence of concepts and techniques which would permit a higher degree of integration of the global videotex information community.