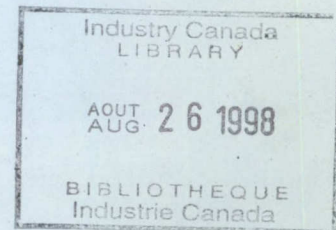


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# Proposal for DOC - BELL CANADA

## Joint Research Into Future Communication Services



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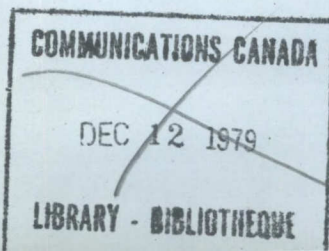
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PROPOSAL FOR DOC - BELL CANADA  
JOINT RESEARCH INTO FUTURE COMMUNICATION SERVICES

December 1976

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## EXECUTIVE SUMMARY

This report on a possible cooperative work program was prepared for the Federal Department of Communications and Bell Canada. It sets out a basis for:

- (a) agreement "in principle" by these two institutions to encourage market and impact research into potential business and residential visual communications (1); and
- (b) the formation of a task force consisting of DOC, Bell Canada and other participants, if any, to plan the aforementioned research.

The first phase of the research would be directed towards collecting and analyzing information required so that a detailed research design could be submitted for approval. Resource requirements for this 12 month research-planning phase are established at 15 man-months for DOC and 10 man-months for Bell Canada plus travel expenses. The research activities are detailed in Chapter III.

The report states that joint research into interactive communications markets is needed now for several reasons:

- To help overcome existing barriers to communications innovations and thereby offer direction to the private communications sector.
- To reduce uncertainty about potential investment opportunities by providing "objective" market data as well as insights into sociological, economic and institutional impacts.
- To ultimately aid regulatory and government agencies in clarifying outstanding issues involving producers, distributors, and carriers of future communication services.

Because of the demonstrated inability of conventional market research methodologies to forecast effectively the utility and demand for new and sometimes market leading communications service concepts, the authors recommend research in the form of pilot trials. Previous North American trials into the potential of communications have often been guided by a philosophy of "technology push" with little or no careful planning of the service and market aspects of the research. The proposed research focuses on these latter aspects.

This report proposes the formation of a DOC - Bell Canada initiated consortium of government and industry groups to invest in carefully designed experimental trials having the following objectives:

- To identify subsets of public and private visual communications services which the public will want, need and/or be willing to pay for.
- To provide quantitative as well as qualitative indicators of future business and residential visual communication service markets by the 1985 time frame.
- To explore the impacts of widespread adoption of potential visual services on society and its institutions in general.
- To help determine how future visual services should be managed with regard for regulatory and consumer problems.

This proposal examines the need for joint research, identifies the objectives of the trials, and details the nature and scope of the proposed research. A flow-chart of the overall research plan can be found on page 10.

- (1) A visual communication service is any narrowband or broadband service in which information/programming is displayed to the subscriber over a CRT, television, or other display terminal.

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## 1. NEED FOR JOINT RESEARCH

### 1.1 POTENTIAL IMPACTS OF COMMUNICATIONS

As the complexity of an industrialized society increases so grows the need for improved communications. Evolving communications technology will be capable of handling these information needs. New applications of communications can allow for greater geographic decentralization of business institutions and ultimately residential communities. Growing concern for the environment, increasing vehicular traffic congestion and the rate of depletion of Canada's petroleum resources will influence the extent to which telecommunications will serve as a supplement or alternate for travel. Although forecasts of the introduction and market penetration of future services vary, planners agree that their introduction may induce significant social, political and economic impacts. Appendix I summarizes some of the potential impacts of interactive communication services.

Most of the service concepts, however, have yet to be proven marketable, economically viable or socially desirable. Hence the need for an objective assessment of the markets and impacts of potential services. A jointly primed research venture between DOC and Bell Canada can help ensure this objectivity. In so doing it is hoped that the business opportunities and social impacts forecast will seem sufficiently profitable or unprofitable, pleasant or unpleasant, so as to guide the course of communications sectors in the future. The considerable amounts of funds being allocated throughout the world to research new applications of communications and their impacts indicate a growing awareness of their potential.

### 1.2 BARRIERS TO COMMUNICATIONS INNOVATIONS

Social, historical and geographic factors in Canada are not conducive to the development of some new communication services. Historically each of the communication sectors have evolved in a manner consistent with its own goals considering public, regulatory, financial and technological restrictions. Little effective action has been taken to resolve issues such as: what potential markets are economically viable; who should produce the services' contents; who should be paid to provide the service; and who should carry the service. Effective long term expansion of the communications industry in the visual service markets can not occur unless these issues are resolved.

Telephone and data communication networks have evolved, with few exceptions, in a manner guided primarily by the availability of new technology and constrained by restrictions imposed by investment in existing telecommunications plant. Heavy investments in telecommunication plant, requiring long depreciation schedules, dictate evolutionary rather than revolutionary changes in this sector.

The development of new communication services into the home has been influenced by many independent cable systems as well as by regulatory decisions which have not addressed the problems of attaining optimal long run use of the medium. Regulation has been concerned with immediate commercial impacts and competition between the broadcasting and CATV industries.

The remaining terrestrial communication/information channels such as print media and the post office are feeling pressures to further mechanize their operations. The Toronto Star, for example, is converting to electronic text editing. Once such information is prepared in electronic form, a logical question to answer is why shouldn't it also be delivered as such.

As a result of this segregated development, today there exists in Canada a number of different types of facilities and services which are independent and distinct. Each has its own separate infrastructure for operating, maintenance, accounting and billing as well as its own need for expansion capital. Yet each sector has a common objective in that each seeks to operate and offer communications within residential and business communities.

Complex questions pertaining to the economic viability, social acceptance, technical feasibility and impacts of government policy and regulation need to be answered for the services presented in this report. These latter regulatory and government policy issues can only be effectively addressed once specific markets and impacts have been identified. Even if one discounts the uncertain regulatory situation, the combination of yet unproven markets, rapidly evolving technologies, and heavy investment requirements (probably resulting in negative cash flow over much of the systems early lives) are not conducive to attracting needed capital.

What is proposed is a market or service demand approach which will bring together interested government, industry and user groups in a carefully planned market research venture.

### 1.3 BENEFITS OF JOINT RESEARCH

Bell Canada - DOC joint research projects, directed towards identifying the market demand and impacts of new communications services, can not only provide "objective" demand information to the private communications sector but can ultimately also aid regulatory and policy agencies in clarifying outstanding issues involving producers, suppliers and carriers of future communication services.

Why is participation by carriers, and information/program (software) suppliers in exploratory research desirable?

- Substantial resources are required for such ventures and success is not certain. It is questionable whether any one party would be capable of independently undertaking comprehensive research of the type proposed in this paper.
- The benefits of the research can be shared by more than one risk taker and eventually by several communications sectors.

Why should private communication operators, carriers and program suppliers invest in market/impact research?

- so as to reduce uncertainty about potential investment opportunities - specifically to learn more about market demands, applications, service formats and impacts.

Why should government invest in market/impact research?

Government interest in this project stems from:

- the need for consideration of the possible utility of the ultimate rationalization and identification of roles between the carriers, CATV and



broadcasting industries;

- the need to assess the suitability of the present institutional environment for the introduction of new services;
- the need to explore means for facilitating the delivery of public/social information.

## 2. OBJECTIVES OF RESEARCH

The proposed research program is directed towards serving the medium term information needs of participants by exploring the markets and impacts of public and private applications of communications technology. The objectives of the research are:

- A. To identify subsets of public and private visual communication services which the public may want, need and/or be willing to pay for up to 1985.
- B. To provide quantitative as well as qualitative indicators of business and residential visual communication service markets so communication networks can be prepared to carry "selected" services when the market so demands.
- C. To explore the impacts on social conditions of widespread adoption of visual services. To assess the desirability of social conditions brought about by such adoption. (e.g. Will there be disruptions in home life, transportation, employment or loss in privacy?)
- D. To help determine how such services should be best managed in the interests of the entire community with proper regard for regulatory and consumer problems.
- E. To help identify economic constraints and thereby ultimately guide in the development of economically viable hardware and software systems for those services which are found desirable.

### 3. RESEARCH PLAN

#### 3.1 SCOPE OF RESEARCH - POTENTIAL SERVICES

Potential communication services can be classified in a number of ways. Five classification schemes have been developed with the intent of providing some initial insight into the nature of these services and offering the opportunity of conceptualizing them in different dimensions. These segmentations also serve to introduce and define terminology. For the purposes of this report it was most valuable to adopt the classification according to their end use. The five classifications schemes are detailed in Appendix II.

Business communities have the need for innovative communication services and the finances to encourage their development. Many of these services eventually evolve to serve the needs of other sectors in society. Consequently communications research in the business environment is important to the future direction of many residential communication services. If the research is to be comprehensive and realistic, elements of business markets must therefore also be an integral part of the study. Many services are expected to penetrate business and institutional communities before residential markets. The British Post Office for example expects near-to-medium term business revenues from its "Viewdata", narrowband information retrieval system, to exceed residential revenues. Because of the capital intensive nature of the communications industry, only some of the services being contemplated may be capable of achieving economic feasibility on a stand alone basis. Therefore, the provision of clusters of services to cross sections of potential markets must also be explored.

The seventeen service categories classified according to end use have been subdivided into high priority and low priority type services. The high priority group contains those service categories which, in the opinion of the task force, would be valuable to evaluate at this time. The low priority group represents those services which are being examined in sufficient detail elsewhere.

### 3.1.1 HIGH PRIORITY SERVICE CATEGORIES

#### (a) Information Transmission/Retrieval Services:

Shopping Services - product information, remote shopping;

Medical Services - health care information, remote diagnosis and monitoring;

Education services - interactive tutoring services, computer assisted instruction, non-interactive discretely selectable educational programming;

Travel Services - schedule information, remote reservations;

Information Retrieval Services

(not covered elsewhere) - remote access to business files, secretarial assistance, consumer advisory services, remote access to personal files, library catalogues, articles, community information services;

Opinion Polling Services - automated surveys, new audience participation entertainment programming, participative interactive broadcasting;

Entertainment/Recreational Services - premium TV, recreational courses and games;

Electronic Publishing/Print Services.

#### (b) Two-Way Communication Services:

Computer Augmented Communications;

Conference TV;

Interactive Graphical Communications.

As this is the first stage of a cyclical process aimed at defining the particular services of interest, and in order not to prejudice future discussions with potential participants, the task force has documented its personal views as to the format and apparent demand for each service grouping in Appendix III.

### 3.2 RESEARCH METHODOLOGIES

Comprehensive studies of the demand for these services have not been carried out in Canada. Attempts at predicting market demands in the U.S.A. have had optimistic or unconvincing results.

Previous studies have relied mainly on conventional survey methodologies (such as questionnaires, interviews possibly in conjunction with videotape demos, delphi, etc.). These techniques have been favourite tools of futurists and researchers primarily because of their relatively modest cost compared to experimental methods. Assuming that such surveys are properly designed and that consumers are willing to disclose and carry out their intentions, they are capable of yielding reliable results when applied to contemporary service/product concepts. Evaluation of the results of past research into future communication services indicates that most conventional survey research methodologies are at best of questionable value in evaluating market leading products or services which have no direct substitutes. Consumers have difficulty in predicting or perceiving the utility and impacts of new and what sometimes appear to be abstractly defined concepts - without actually having experienced the service or product. Until survey techniques evolve which are capable of evaluating such markets, experimental methods in the form of hands-on trials appear to be the most valid approach.

### 3.3 MULTIPARTICIPANT GUIDELINES

The proposed research activity cannot be completely segregated to any one institution under existing regulatory and institutional environments. Consequently it should include other parties such as CATV operators, broadcasting interests, and software suppliers on an as needed basis. Multiple participation brings with it a number of potential problems. It is important to obtain agreement that:

- the pilot system research will not restrict the ultimate options of any participant;
- information derived from the planning and research activities will be

released in the form of a joint report, subject to the concurrence of the participants.

### 3.4 THE RESEARCH PLAN

The overall research plan is split into two phases. Phase I consists of those activities which are necessary to provide a comprehensive plan for the pilot system(s). Phase II is concerned with the final design, implementation and evaluation of the system(s). The milestone activities of the research are summarized in Figure 1.



PROPOSAL FOR STRUCTURED RESEARCH  
INTO POTENTIAL COMMUNICATIONS MARKETS AND IMPACTS

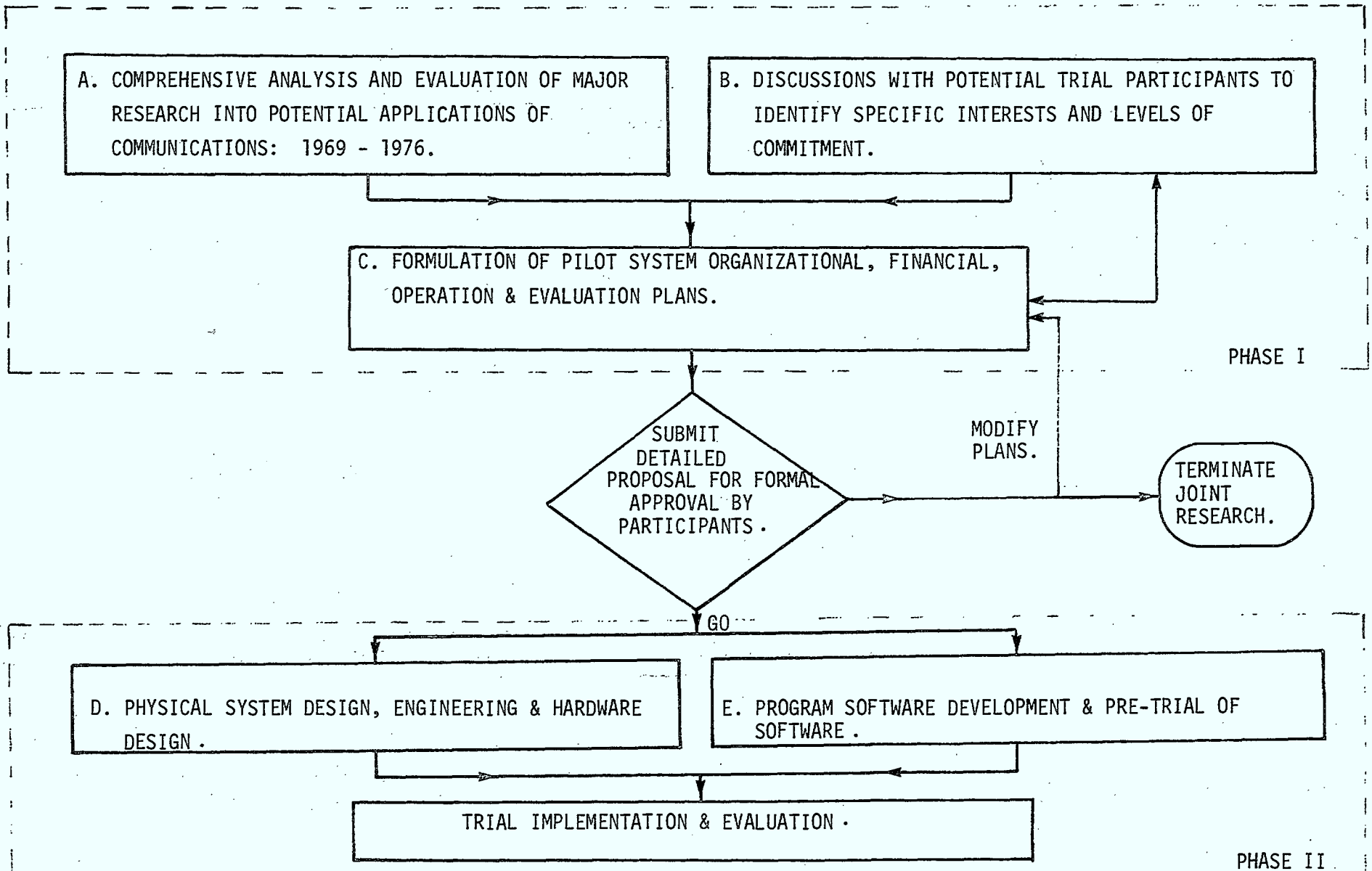


FIGURE 1

### 3.4.1 PHASE I

The following activities are proposed in order to meet Phase I objectives:

#### A. Comprehensive Analysis and Evaluation of Major Research Activity Into Potential Communication Services

Many pilot systems have been implemented across the world by government industry and institutions between 1969 and 1976. An in-depth analysis of their case histories would provide valuable information relative to any future trials. This task force feels there is a lot to be learned from others' experiences, mistakes ... etc. Yet no comprehensive analysis of past trials is available today. Specifically, the investigation will identify:

- the research objectives (i.e. Was it a technical feasibility, economic viability, concept (utility), market assessment or jurisdictional/political trial?);
- the reasons for choice of target markets and services;
- financing arrangements (i.e. private or government grants);
- outcomes and conclusions.

#### B. Discussions with Potential Trial Participants

Possible services have already been identified in Appendix III. The list needs elaboration to emphasize the specific interests and involvements of potential participants. Consultations will take place with potentially interested participants.

#### C. Pilot Systems Plan

The results of the previous two activities will be combined to develop the pilot systems plan which will define:

- the organizational/management plan;
- the financial plan;
- the services to be trialed;
- the transmission media;
- the hardware requirements;
- the software (program and intelligence) requirements;
- the location(s)/size/duration and demographics of the trial(s);
- the evaluation and tracking plan.

Since the primary objectives of the research relate to service markets and their impacts, technology should only be regarded as a tool for attaining these objectives. State of the art technology with minimal development should be applied in the provision of facilities for the pilot system(s). In line with these intentions, the exploration of discretely selectable, on demand, broadband services is feasible, even though these may only be economically viable over non-existing networks. Specific issues concerning optimal hardware and transmission configurations will be addressed once preliminary research has provided necessary planning inputs.

#### 3.4.2 PHASE II

The major activities of this phase consist of:

- (a) the design of the hardware and transmission network;
- (b) the development and pre-trial of the program and control software; and,
- (c) the implementation and testing of the pilot system.

#### 3.5 TIMING AND RESOURCE ALLOCATION

It is anticipated at this time that the total research activity will require four years. A detailed breakdown of the resource requirements and activity schedule for Phase I is shown in Figures 2 and 3. It is estimated that Phase I will take 12 calendar months to complete and will require a total of 25 man months of effort.

Because other participating parties have yet to be formally identified and their scale of involvement is as yet unknown, Phase II resource requirements can only be presented at the completion of Phase I.

PHASE I - RESEARCH REQUIREMENTS

<u>ACTIVITIES</u>	<u>DOC</u>	<u>RESOURCES</u>	
		<u>BELL</u>	<u>TOTAL</u>
		(MAN MONTHS)	
ANALYSIS OF PAST/ONGOING RESEARCH	5	5	10
- Documentation of trials, objectives, target markets & services.			
- Evaluation of trials, outcomes, conclusions reasons for success/failure.			
DISCUSSIONS WITH POTENTIAL PARTICIPANTS	6	1	7
PILOT SYSTEMS PLAN	4	4	8
- Specify organizational/management plan, target services, financial plan, transmission network, hardware & software requirements, trial and evaluation plan.	—	—	—
PHASE I RESOURCE REQUIREMENTS	15	10	25

FIGURE 2

PHASE I

ACTIVITY SCHEDULE

ACTIVITY	1976			1977								
	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
Evaluation of Previous Research	XX											
Discussions with Potential Trial Participants				XX								
Pilot System Plan										XX		

FIGURE 3



#### 4. LONG RANGE VIEW

While the future of communications systems is difficult to forecast, we know that change will come and that it will be evolutionary rather than revolutionary. New forms of communications will displace some of the services formerly monopolized by established technologies. Whether these services can become economically viable on a stand alone basis is not known. Market research may indicate that several services might have to be integrated in order to make hardware and software cost effective.

Market needs, wants and associated impacts should clearly form the foundations for future regulatory thrusts, for the development and application of new technologies and for new business ventures. Yet few such measures are available today. It is hoped that the business opportunities and social impacts identified by this research will seem sufficiently profitable or unprofitable, pleasant or unpleasant so as to help guide the course of communications in Canada.

APPENDIX I

POTENTIAL PRIMARY IMPACTS OF INTERACTIVE  
TELECOMMUNICATION SERVICES

APPLICATIONS

IMPACTS

1. EDUCATION

- computer assisted instruction
- computerized library service
- audio/visual retrieval services
- administrative services

- better trained work force
- better informed citizenry
- less unemployed due to skill deficiencies
- heightened tensions and inequalities in less developed countries if not carefully implemented

2. BUSINESS

- cashless-chequeless transactions
- computer mediated interaction
- interactive audio/visual services
- electronic mail
- information retrieval services

- more convenient business transactions
- quicker more efficient communications
- better informed business and professional personnel

3. RESIDENTIAL

- remote shopping transactions
- product and service sales information
- electronic mail
- consumer advisory services
- electronic news services
- entertainment services
- movie and restaurant guides

- more convenient shopping
- better informed citizens
- less consumer victimization
- more leisure time
- more ways of spending leisure time

4. MEDICAL

- remote (perhaps computer assisted) diagnosis
- emergency medical information
- health and welfare services

- better distribution of expert medical knowledge
- fewer deaths, quicker effective medical care

5. OPINION POLLING

- electronic polling surveys
- political channels for candidates
- interactive broadcasting services

- more responsive public officials
- new forms of interactive entertainment
- increased use and reliability of opinion polls and audience response surveys

6. SECURITY/METERING

- intruder, fire, and smoke alarms
- remote water, electric & gas meter reading

- safer, more "controlled" communities
- slightly reduced utility rates

POTENTIAL SECONDARY IMPACTS OF INTERACTIVE  
TELECOMMUNICATIONS SERVICES

1. ECONOMIC, INDUSTRIAL IMPACTS

- major realignment of communications industry
- reduced volume of business travel
- increased pressure on mass media to improve program quality
- reduced use of postal services for business transactions and correspondence
- reduced advertising support for hard copy newspapers
- increased demand for local television programming and support personnel

2. POLITICAL, GOVERNMENTAL IMPACTS

- increased political disputes as to who should regulate these services
- greater citizen participation in municipal, provincial and national affairs
- reduced correlation between a politician's financial backing and his ability to access voters
- reduced problems in invoking "equal time" doctrines
- increased problems with defamation, fraud, and obscenity

3. LEGAL IMPACTS

- increased pressure for legislative decisions on concepts such as "common carrier"
- development of complex monopolistic competition problems in the form of cross-media ownerships
- mounting pressure for an overhaul of copyright laws in light of new media

4. LEISURE, CULTURAL IMPACTS

- increased consumer choice of entertainment programming
- decreased use of books and other printed matter
- evolution of electronic equivalents to junk mail

5. SOCIETAL IMPACTS

- increased attention paid to the communications needs of geographically isolated communities (e.g. Canadian North)
- reduced feeling of national unity resulting from a fractionalization of audiences
- decentralized education
- reduced dependence on the urban centers for business transactions
- increased threat of invasion of privacy

APPENDIX II

FUTURE COMMUNICATION SERVICES

A. COMMUNICATIONS SERVICES CLASSIFIED ACCORDING TO FORM OF COMMUNICATION

- (1) Telephony
- (2) Conference Audio Communications
- (3) Data Communications:
  - (a) circuit switched;
  - (b) packet switched.
- (4) Data Polling:
  - (a) alarms;
  - (b) metering;
  - (c) opinion polling;
  - (d) signalling.
- (5) Interactive Graphical Communications
- (6) CATV
- (7) "Single Frame" Retrieval of Visual Information
- (8) Retrieval of Visual Programming or Information
- (9) Two-Way Video Communications

B. COMMUNICATION SERVICES CLASSIFIED ACCORDING TO THE FLEXIBILITY OFFERED TO SUBSCRIBERS

- (1) One-way Non-Interactive Information Services - e.g. "CEEFAX"
- (2) Narrowband Subscriber Response Services
  - transmission of short data responses originating from a central point, to queries possibly requesting narrowband or broadband programming:
    - Interactive television (e.g. remote shopping; civil service information; opinion polling; entertainment programming)
    - Telemetry (e.g. audience counting; meter reading; alarm monitoring)
    - Discretely addressable, on demand, premium television
- (3) Shared Two-Way Services
  - subscribers share return channels to a central point:

- Voice response (e.g. instructional or entertainment programming)
  - Video response (e.g. instructional or entertainment programming, remote medical diagnosis)
- (4) Subscriber Initiated Services
- subscribers can request information or programming from various services: (e.g. computer time sharing; ticket and reservation service; catalogue shopping; banking services; dial-up video library)
- (5) Point to Point Services
- the most sophisticated of the four service categories enable subscribers to directly transmit voice, video, or data to other subscribers (e.g. message transmission, high speed data exchange, facsimile, interactive graphics, conference TV, video-telephone)

C. VIDEO SERVICES CLASSIFIED ACCORDING TO THE DIRECTION OF WIDEBAND COMMUNICATION

- (1) Point to Mass Video Services
- involve a single sending point and many receiving points (e.g. CATV, non-dedicated forms of Pay TV services, "CEEFAX")...
- (2) Point to Point One-Way Video Services
- include closed circuit service offerings (e.g. dedicated Pay TV, security monitors, process control)
- (3) Two-Way Asymmetrically Interactive Video Services
- those services where broadband video transmission is in response to narrowband signals from "receive" location back to the "send" location (e.g. "tele-shopping" and computer assisted instruction using visual aids)
- (4) Two-Way Symmetrically Interactive Video Services
- those services requiring full two way broadband capability (e.g. video-telephone, conference TV)

D. COMMUNICATION SERVICES SEGMENTED BY THEIR DEGREE OF COMPETITION WITH OTHER TECHNOLOGIES

- (1) New services for which no competing technology comes close to satisfying the needs (e.g. quick response citizen referendums, remote access to library stored information).



- (2) Services which satisfy needs already being met by other technologies or services but do so in a more economic, more efficient or socially more desirable fashion (e.g. remote access to expanded "Yellow Pages" on computer files).

E. CATEGORIES OF SERVICES CLASSIFIED ACCORDING TO THEIR END USE

- (1) Two-Way Communication Services:
  - (a) Computer Mediated Communications;
  - (b) Quality audio communications;
  - (c) Conference TV;
  - (d) Interactive graphics;
  - (e) Video-telephone
- (2) Information Transmission/Retrieval Services
  - (a) Financial Services
    - cashless chequeless transactions, electronic funds transfer, financial information services;
  - (b) Shopping Services
    - product information, remote shopping;
  - (c) Medical Services
    - health care information, remote diagnosis and monitoring;
  - (d) Education Services
    - interactive tutoring services computer assisted instruction, non-interactive discretely addressable educational programming;
  - (e) Travel Services
    - schedule information, remote reservations;
  - (f) Electronic Mail Services
    - use of facsimile networks, electronic transmission of first class mail;
  - (g) Information Retrieval Services (not included in any of above)
    - remote access to business files, secretarial assistance, consumer advisory services, remote access to personal files, library catalogues, articles, community information services;
  - (h) Security Services
    - intruder, fire or smoke alarms;
  - (i) Metering Services
    - remote water, electric, or gas meter reading;

(j) Opinion Polling Services

- automated surveys, new audience participation entertainment programming, participative interactive broadcasting;

(k) Entertainment/Recreational Services

- premium TV, recreational courses and games;

(l) Electronic Publishing/Print Services.

Section 1 of this Appendix further expands some of the Priority I service groupings outlined in Chapter III. The views given here are the personal views of the authors and should only be used as a guide towards further definition of the services of interest. Section 2 provides relative estimates of the potential market sizes; availability of hardware, availability of software, social desirability, impact on the communications infrastructure and the impact on employment by each of the service categories.

## 1. SERVICES

### (a) Shopping Services

Shopping services can be divided into two categories:

- those providing product comparison information,
- those enabling remote shopping transactions.

The first category could range from a consumer report/advisory type service to one which provides up-to-date cost/product information which would be used for daily or weekly cross-comparisons of products sold by retailers or wholesalers.

The second category includes services which enable the actual ordering of products from electronic catalogues.

The major factors affecting these services are the costs of updating, indexing and formatting the data. It would be unrealistic to consider services which frequently required major changes in product data. The format of these services is conceived as on-demand, discretely selectable, alphanumeric with perhaps the addition of one-way, still frame video.

### (b) Medical Services

- computer aided analysis,
- computer aided peer review,
- medical computer conferencing,
- access to drug information,
- access to epidemiological information system,
- access to health hazard appraisal systems.

The potential for such services stems from the current unavailability of medical information/communication systems capable of raising the standards of health care systems. Cardiovascular disease, for example, has been recognized as a major cause of mortality and as being costly to Canadian health care systems as well as to the individual in terms of lost earnings. An information system providing periodic information to the physician combined with automated historical electrocardiogram analysis could be a major step towards earlier and more accurate diagnosis.

(c) Education Services

Education services of interest could include:

- interactive computer tutoring by accessing a library of self-help programs
- remote lecturing
- non-interactive, discretely selectable, on demand educational programming.

The greatest potential for educational services is expected to manifest itself in post secondary, adult education courses to the home. Studies by OECA have shown that fifty percent of the people over the age of 25 desire further education. Consequently the services of interest would be those which offer equivalent credit of "how to" courses off campus.

(d) Travel Services

Travel services for the residential market can be divided into two general categories:

- (i) those providing information to enable the subscriber to make a decision; and,
- (ii) those which are primarily entertainment in nature.

They include:

- local traffic condition reports;
- highway traffic/weather condition reports;
- local public transportation routes and schedules;
- availability of local/regional/national recreational facilities (e.g. campsites);
- foreign vacation programming.

Possible formats foreseen are:

- visual information transmitted from cameras to one or more central locations for reporting via conventional public broadcasting. This service would provide more immediate information on traffic conditions than current mobile or helicopter reporting.
- transmittal of visual information to the home on a sequential basis.
- visual presentation of the above information to the home on an on-demand, discretely selectable basis.

The largest market for "decision type" travel services is expected to be for those services which provide local information while the most successful "entertainment type" travel software is likely to be that which deals with remote environments, cultures, etc.

Travel services for the business market is expected to evolve around the provision of discretely selectable schedule and reservation information.

(e) Opinion Polling Services ✓

The service potential of narrowband polling services has been the subject of much discussion among communications planners. Service applications, arising from the ability of consumers to signal their interest in, or opinions of, issues raised in a broadcast program or advertisement, range from government sponsored consumer surveys aimed at identifying hazards of manufacturing defects of products, commercially sponsored marketing/product surveys, to new forms of participative entertainment broadcasting.

Bell Canada has developed the technology behind this concept to the point where it can now offer polling capability over its plant even while residential telephones remain on-hook (thereby avoiding network traffic overload). Responses to broadcast inquiries can thus be recorded electronically and reported to the purchaser of the service.

The potential for a significant demand for such service categories is indicated by:

- (1) a growing consumerism movement;
- (2) the need by commercial enterprises for reliable and more efficiently obtainable market information; and,
- (3) socio-economic trends towards more "leisure" hours per day coupled with the complementary need for more and new forms of recreation and entertainment.

One flow of funds scenario has a Bell Canada subsidiary collecting a fee for monitoring and recording the survey circuits from the survey purchaser - be it government, private industry or broadcaster. The households taking part in the survey could also be rewarded (when required) by offered product discount coupons or knowledge of the survey results.

(f) Entertainment Services

Frame-grabbing or full video, premium entertainment services over terrestrial or over-the-air networks could include National Filmboard, travel-log, electronic games between remote participants, sports or movie programming. The format of these services could range between sophisticated, discretely selectable, privately addressable, on-demand versions and the type of non-private, directly selectable, queued broadcast entertainment currently offered in St. Hubert by one CATV operator.

Because of its proximity to widespread introduction, pay-TV is expected to be a prime component of this category of services. Communications minister, Jeanne Sauve, has indicated that she favours per program, usage sensitive, billing for such services but would be willing to initially allow a per-channel approach. Bell Canada is now capable of using its facilities to handle the tracking, accounting, and billing of these services on a usage-sensitive basis. Estimates for the demand of pay-TV combined with socio-economic trends towards an increase in the daily per capita, "leisure" hours indicate that this category of residential services should be further explored (Mme Sauve estimates gross revenues of some 39 million assuming 15% of the CATV subscribers want pay-TV).

One funds flow scenario based on existing conventional networks would divide the revenues collected from the subscriber over the long run between the program carrier (e.g. CATV); the program originator (e.g. broadcasters, program producers), the software supplier (head end) and tracking/billing/accounting agency (e.g. Bell Canada).

(g) Electronic Publishing/Print Services

This category refers to those information services which are encompassed by the print media and the mail. There are numerous programs underway to mechanize these operations. An extension of this is the form of delivering the information to the subscriber electronically can be envisaged. This could take the form of a dedicated or a more general form of electronic newspaper. The organization and specific content of the dedicated version would depend upon the needs of the particular users or institutions thereby assisting those already burdened by information overload.

2. RELATIVE DEMAND ESTIMATES

The following table ranks market demands, factors influencing the availability of the services, and impacts of the twelve residential service categories presented in this proposal.



SUBJECTIVE COMPARISON OF SERVICES

RESIDENTIAL SERVICES	Financial	Shopping	Medical	Educational	Travel	Electronic Mail	Info. Retrieval	Security	Automatic Meter Reading	Opinion Polling	Entertainment	Ranking Scale	
												1	5
Potential 1990 Market Size (# Subscriber)	3	3	3	4	2	2	2	2	5	2	5	Small	Large
Availability of Software <sup>1</sup>	5	2	1	2	1	5	1	5	5	4	5	Low	High
Availability of Hardware <sup>2</sup>	4	2-4	4	3	2	4	2-4	5	5	5	4	Low	High
Social Desirability	3	4	5	5	4	3	3	4	2	3	2	Low	High
Impact of Communications Infrastructure <sup>3</sup>	2	2	2	4	4	1	4	1	1	2	5	Small	Large
Impact on Employment	1	1	1	2	1	1	3	1	1	2	3	Small	Large

<sup>1</sup>Assumes the existence of a data base, not necessarily in usable format.

<sup>2</sup>Includes the transmission system to carry a viable service.

<sup>3</sup>Assumed to vary with video content in programming.