

DEPARTMENT OF COMMUNICATIONS

Toward a Policy Framework for the
Economic Development of the
Communications/Information Sector

INTERIM REPORT

AUGUST 1981

Price
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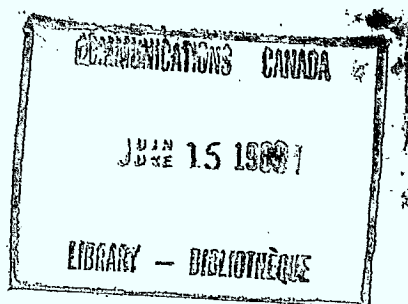
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DEPARTMENT OF COMMUNICATIONS

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Economic Development of the
Communications/Information Sector

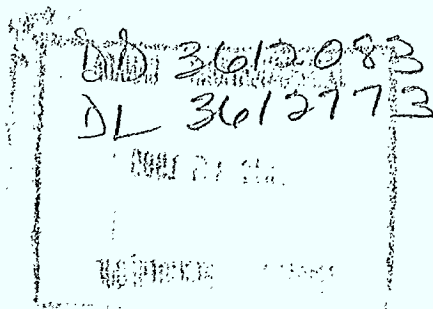
INTERIM REPORT

AUGUST 1981



Computers
Telex
radio
telephone → carrier services
equipment
all new services left out

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DEPARTMENT OF COMMUNICATIONS

Policy Framework for the
Economic Development of the
Communications/Information Sector

INTERIM REPORT

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1. INTRODUCTION

The primary objective of this study is to "provide a comprehensive assessment of the key characteristics of the communications/information sector and of the major trends which one likely to affect its growth and its contribution to economic development in the 1980's". The study is also expected to assist the department in analysing key economic development policy issues and in identifying the role which could be played by government.

The scope of the project is extremely broad, and there are gaps and weaknesses in the basic data which cannot be remedied in the context of such a project. On the positive side, however, studies have already been done on many of the individual industries within the sector. Our task is to make use of these previous studies, together with a limited number of interviews with knowledgeable people in different parts of the sector, in order to develop a more coherent overview of the communications/information sector as a whole and its evolution.

This interim report is a working document, not a final statement of conclusions. The last six chapters bring together the key characteristics identified to date for the six components of the sector. These characteristics are grouped under eight headings:

- . description;
- . markets;
- . trade;
- . operations;
- . finances;
- . concentration/ownership;
- . geographical distribution; and
- . government involvement.

In certain components, particularly equipment and computer services, the identification of characteristics remains incomplete because of delays in the scheduling of interviews.

The chapters at the beginning of the report take a broader, and therefore more tentative, look at the communications/information sector as a whole. They deal with its size and scope, some common elements, and the linkages among components. These chapters are intended as a basis of discussion, and of further development as the study proceeds.

2. SCOPE AND SIZE

Definition

The definition of the communications/information sector used in this study is deliberately narrow. Some other authors, to demonstrate the pervasiveness of information-related activities, have defined them to include such diverse occupations as civil engineers, insurance agents, judges, bookkeepers and production foremen. Under such a definition, 40% or more of total employment in Canada falls within the information sector. We do not wish to minimize the usefulness of such statistics in underlining the importance of information to the economy as a whole. However, our study concentrates on what may be considered the heartland of the sector - organizations which are in the business of information. These are also industries for which the Department of Communications has, in most cases, a measure of responsibility.

More specifically, the working definition of the sector agreed upon with the department is as follows:

1. The transmission or communication of information (including entertainment).
2. The preparation of information in a format suitable for transmission.
3. The production, sale and maintenance of equipment, software or other means for:
 - . transmitting information;
 - . preparing information in a format suitable for transmission; and,
 - . receiving information.

It was also agreed that the study would deal to a limited extent with similar activities carried on within companies to serve their own needs, such as in-house data processing, and with related activities such as advertising, education and printing. However, these are not considered to be part of the sector for purposes of the study.

For convenience in carrying out the study, we have divided the sector into six components:

- message transmission, including telecommunications, postal and courier services;
- program distribution, including radio and television broadcasting, cable systems, and motion picture theatres and distributors;
- program production, including motion picture production, radio and television program production and sound recording;
- publishing, including the publishing of books, periodicals and newspapers and the operation of libraries and electronic information services;
- computer services, including service bureaus and software houses;
- equipment, including the production and distribution of telecommunications equipment, EDP and other office automation equipment and home entertainment equipment.

These components reflect the present structure of the sector, and the grouping may be altered substantially later in the study.

Size of Sector

Because the communications/information sector crosses the boundaries of the traditional industrial classification structure, its size in relation to the total economy cannot be reckoned readily from published data. However, the communications sector as defined by Statistics Canada, which is much narrower, accounted for 2.7% of gross domestic product (GDP) at

factor cost in 1979*, and a similar proportion of wages, salaries and supplementary labour income. Rough calculations suggest that the communications/information sector as we have defined it accounted for about four percent of GDP and over 300,000 jobs in 1979.

Economic Significance

It would be a very serious mistake to gauge the economic significance of the sector solely on the basis of proportions of employment or gross domestic product. For example:

- the message transmission component is a vital part of the economic infrastructure, without which the operation of large national and international businesses is inconceivable;
- such businesses have also come to rely heavily on EDP, office automation equipment and related software, whether owned by them or used through the facilities of service bureaus;
- the marketing activities characteristic of a developed country are difficult to imagine without the media of newspapers, magazines, radio and television; and
- the initial and continuing education of a sophisticated labour force depends heavily on publishing, particularly of books.

A variety of authors, ranging from Toffler and Servan-Schreiber to the Clyne Committee, have asserted that we are in the midst of an Information Revolution as profound as the Industrial Revolution. They may well be right. However, such pronouncements tend to obscure the critical contribution of the communications/information sector to the industrial revolution itself and to subsequent development. The contribution of better

* Statistics Canada Catalogue 13-201, Annual. In this context, the sector consists of telephone, other telecommunications, postal service, radio and television broadcasting (including in-house program production), and cable systems. The publishing, computer services and equipment components are omitted from the Statistics Canada definition, as are smaller elements such as courier services, motion picture theatres, independent program producers, and sound recording.

transport - waterways, railways and ultimately highways and airways - to the opening up of the broad markets and raw material sources required by large scale industry is obvious. The contribution of better communications - printing, postal service, the telegraph, the telephone, not to mention equipment such as the cash register - to the broadening of markets, the development of large organizations and the education of the labour force is less dramatic, but undeniable.

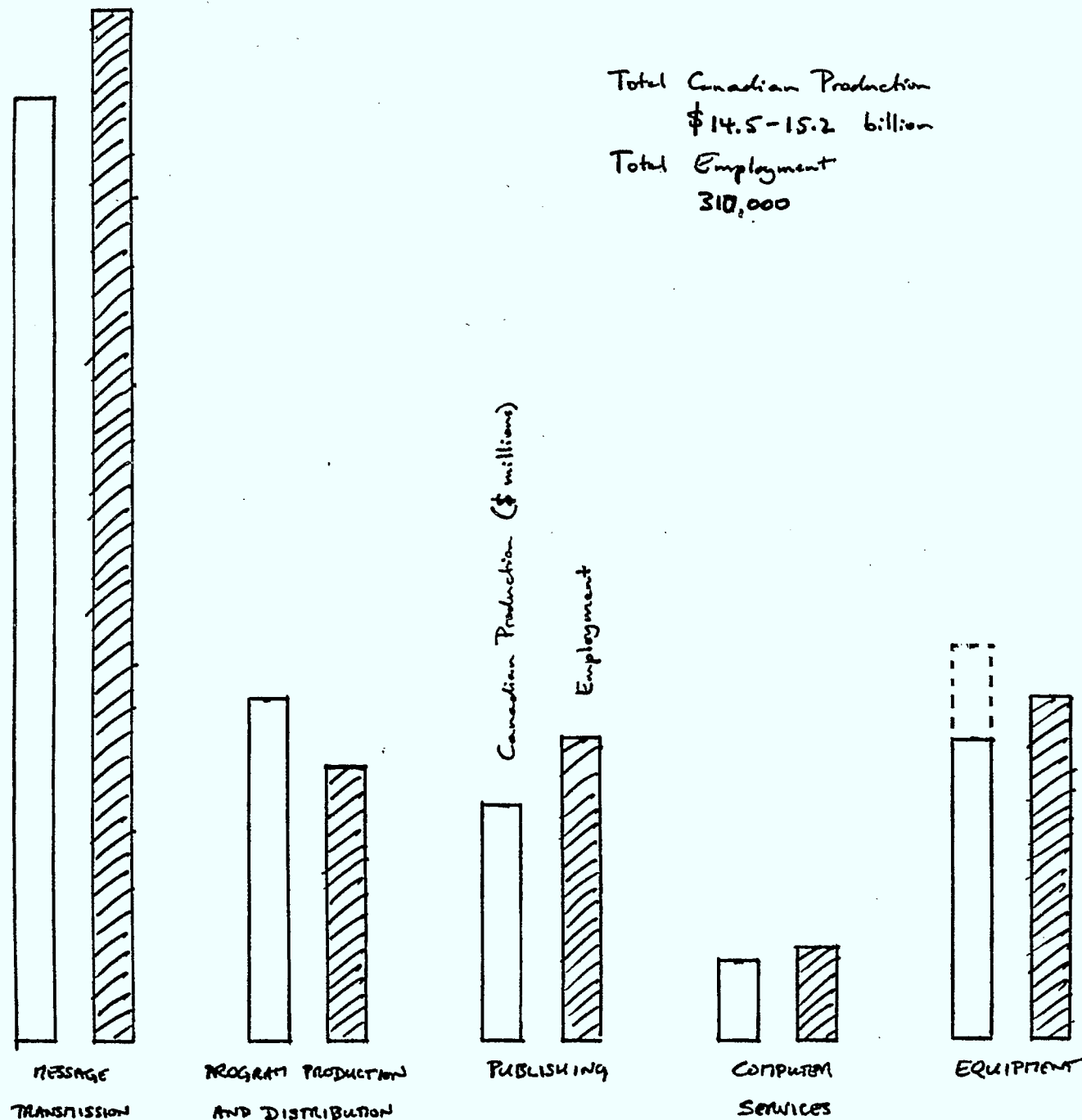
The Information Revolution tends to be described in terms of major electronic inventions such as computers, photocopying and television, and the improvement of existing technologies such as the telephone. However, we should be sceptical about the proposition that technology has been the driving force. After all, the computer was originally seen as a scientific rather than a business machine, there was a long lag from the invention of television to its commercial introduction and technologies such as videoconferencing have never gained market acceptance.

An alternative interpretation is that the importance of the communications/information sector has grown in recent years because of the steadily increasing size, complexity and geographical scope of businesses and public institutions. This development has led to greater needs to process, compile and transmit information within organizations, as well as to communicate with the outside world. At the same time, growing leisure time and discretionary income have stimulated public demand for information products and services. Such demand pressures created the context in which technological information could be profitable.

One very dramatic aspect of technological change in the sector is the declining real cost and increasing performance of equipment, and thus of capital-intensive services such as telecommunications. This change opens up a steadily increasing range of applications for the technology. There are interesting parallels with the industrial revolution in this respect. Technological improvements in that period produced dramatic decreases in

FRAMEWORK STUDY

RELATIVE SIZE OF COMPONENTS



the cost of manufactured materials such as cotton, steel and sulphuric acid, opening the way for new applications, dramatically larger volumes and increased living standards generally.*

It is also commonly argued that the service activities, including offices, have grown as a proportion of total employment because labour productivity in these activities does not appear to have grown as dramatically as in agriculture and manufacturing. The equipment component of the sector is seen as serving this new frontier of mechanization, particularly the office, through increasingly sophisticated data processing, word processing and communication systems. Videotex is also seen as having the potential to replace certain aspects of bank and retail operations. At the same time, robotics, another aspect of electronics, may further increase productivity in manufacturing. If this view is correct, the communications/information equipment component will play a critical role in extending growth in productivity, and therefore in living standards. In this, as in other respects, the economic significance of the sector goes far beyond its own revenues and employment.

Relative Size of Components

The following table, and Exhibit 1 opposite, illustrate the relative size of components within the sector in 1979:**

	Revenue from Canadian Operations (millions)	Employment
Message transmission	\$7,200	157,000
Program production and distribution	2,600	42,000
Publishing (1978)	1,800	46,000
Computer services	600	14,000
Equipment	2,300- 3,000	52,000
TOTAL	\$14,500-15,200	310,000

* Samuel Lilley, "Technological Progress and the Industrial Revolution", in volume 3 of the Fontana Economic History of Europe. The price of sulphuric acid for example, dropped by a factor of a hundred from 1736 to 1749.

** Figures developed from a large number of Statistics Canada publications cited in the body of the report. Governmental appropriations covering the deficits of the CBC and Canada Post are included in revenue.

Message transmission is by far the largest component of the sector, accounting for nearly half of the employment and revenue from Canadian operations. The equipment and publishing components are each roughly equal in size to program production and distribution combined. The smallest component is computer services, although it should be remembered that in-house EDP activities may be in the order of seven to nine times larger.

These figures are presented only to give an idea of the relative order of magnitude of components. Because of industry classification problems, some differences in data definitions and some double counting, they should not be regarded as exact. A range is indicated for the equipment component because of particularly serious statistical problems.

3. SOME COMMON ELEMENTS

At first glance, the economic sector we have called communications/information is extremely diverse. People involved in manufacturing telecommunications equipment, for example, might well doubt that their work has anything significant in common with magazine publishing. The differences are very real, but we are beginning to see common denominators among many parts of the sector which are far larger than the simple common denominators linking all economic activity. There are also important contrasts which can help us to understand the distinctive nature of each industry within the sector. These common denominators and contrasts are discussed below under the same headings used later in the report for individual components.

Markets

1. Business vs Household

Most products and services are sold either largely to business (including governments and public institutions) or largely to consumers. The overlap, where it exists, may be in markets such as small business or affluent consumers. This conventional pattern applies to much of the communications/information sector. For example, television sets in offices are rare, though perhaps not as rare as photocopiers in living rooms. However, the separation of business and household markets is far from absolute, as shown by Appendix A. This appendix is an attempt to list the major flows of products and services among components, and from each component to households and businesses generally.

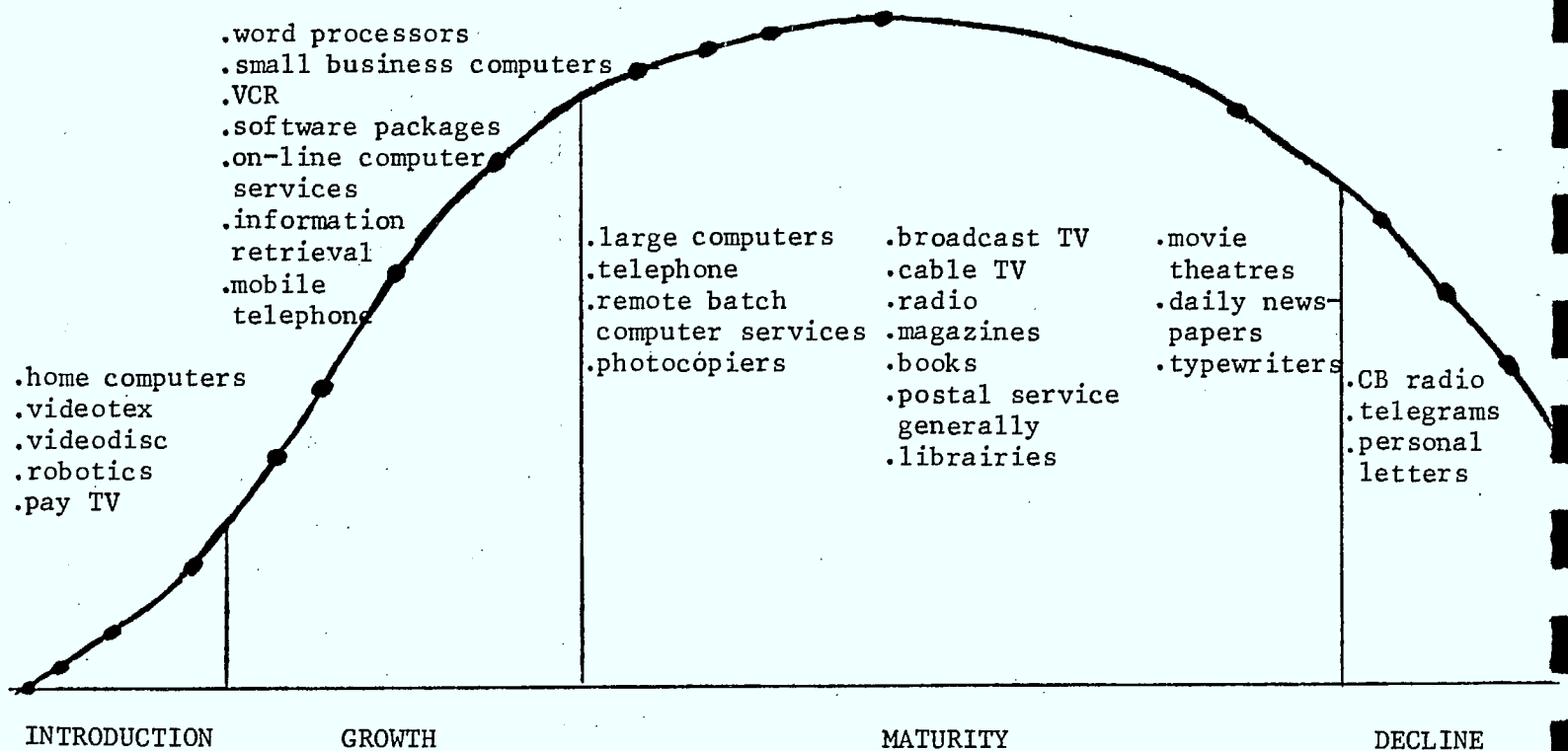
Some of the relationships which emerge from reviewing this matrix are as follows:

- Every component sells some products or services to both markets - business and household. For example, the program production component makes instructional and promotional

films for industry as well as feature films for the household market. Even the computer services component, which is heavily business-oriented, produces software packages for home computers.

- Differences in content, rather than physical form, may distinguish the products intended for business as opposed to household markets - for example, textbooks as opposed to hardcover tradebooks, business magazines as opposed to those for consumers or, for that matter, television advertisements as opposed to programs.
- In most aspects of message transmission, the service would be far less valuable to the customer if it were not used by both businesses and households. Use of the mail for billing and payment and of the telephone for taking retail orders are examples.
- Many "content" products such as television and radio broadcasts, newspapers and magazines must be sold simultaneously both to households and businesses. These products are paid for in whole or part by advertising revenues. However, advertising would not be forthcoming without readers or viewers, who may also pay a portion of the costs. With pay television, it becomes technically feasible to extend the concept of shared advertiser/viewer financing to that medium as well.
- Price discrimination may be practiced when similar products are sold both to businesses and households. For example, businesses pay more for local telephone service and do not have effective access to off-peak rates for long distance. On the other hand, the incoming chief executive of Canada Post has speculated on the possibility of volume discounts for large business mailers.
- Opportunities for growth for some communications/information companies may come from expanding their market from large businesses to smaller ones, then upper income households, then the population as a whole. This is the progression envisaged by many for computers, and is one possible growth path for videotex.

DEPARTMENT OF COMMUNICATIONS
FRAMEWORK STUDY PRODUCT LIFE CYCLE



2. Product Life Cycles

The product life cycle is a well established concept for projecting growth rates and analysing marketing strategies. It can be applied at the level of industries as well as specific products and models. The product life cycle is generally broken into four stages:

- introduction, during which sales are low and growth may be relatively slow. Usually there are only a few producers, who are faced with working out technical problems, building up production capacity and distribution channels and developing customer awareness. Prices are generally high, as are promotional expenditures per dollars of sales. Because of low sales and high costs, producers generally face losses.
- growth, during which sales increase rapidly. The number of competitors tends to increase, and prices may be cut sharply to accelerate growth or discourage entry by other firms. Production costs per unit generally decline substantially, and the quality of the product improves. The business generally becomes profitable, even highly profitable, during this stage.
- maturity, when the product or service has become well-established. Product sales in this phase are dependent largely on replacement and population growth, while service volume growth is gradual. The maturity stage may be long, even indefinite, if no superior product is developed. Profit margins decline to more normal levels, forcing weaker competitors out of the industry. Major producers become well-established, and market shares stabilize. Competitive efforts generally focus on adding features, increasing market segmentation or reducing prices temporarily.
- decline, which may be rapid or very gradual. The number of firms generally declines, as do promotional expenditures and the number of product offerings.

Exhibit 2 opposite shows a preliminary life cycle classification of products and services for Canada. One striking aspect is the difference in the rate at which products pass through the life cycle. CB radio, for example, appears to be well into the decline phase of its brief but spectacular history. The telephone, on the other hand, remains in the early part of the maturity phase, with volume continuing to grow appreciably faster than population.

Individual models of products may have a much more abbreviated life cycle. This is particularly true for mass-market cultural products such as television programs, paperbacks, feature films, and "top 40" records. The distribution channel for such products can only profitably accomodate a small number of models at anyone time, and novelty itself may be a selling point. Items which do not receive rapid public acceptance are therefore dropped. On the other hand, successful items may enjoy a long commercial life. Obsolescence can also be rapid in areas where technology is improving quickly. This has been particularly evident for computers and associated software.

3. Need for Marketing/Consumer Information

Many communications/information products and services repay substantial marketing effort. Moreover, from the standpoint of the consumer, there is a high degree of interest in product information, to the point where he may happily pay for such information.

Some of the reasons are that:

- . few of the sectors' outputs are regarded as necessities;
- . some products are bought infrequently, and the amount involved is large from the buyer's standpoint, as in the case of computers and television sets;
- . some industries have a constant streams of new products, each with its own characteristics and subject to fairly rapid obsolescence, as in the case of records, movies and mass market paperbacks;
- . some product lines are relatively new and penetration of the potential market is low, as in the case of mini and micro-computers, VCR's and electronic information services; and
- . some products are offered only at specific times, such as television programs and movies.

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FRAMEWORK STUDY

BALANCE OF TRADE

POSITIVE	LITTLE TRADE	NEGATIVE
<ul style="list-style-type: none">. Telecommunications Equipment. TV Ad Production. Service Bureaus	<ul style="list-style-type: none">. Telecommunications. Mail Service. Cable Service. Newspapers. Directories. Library Service. Custom Programming. Radio Broadcasting	<ul style="list-style-type: none">. TV Program Production. Film Production. Sound Recording. Books. Periodicals. Software Packages. EDP Equipment. Office Automation Equipment. Consumer Electronics. Electronic Components. TV Broadcasting

These marketing and consumer information needs are discussed further in the chapters on linkages, since they are often met through the services of other components.

Trade

The trade performance of the sector as a whole is cause for concern, as Exhibit 3 opposite suggests. However, it is extraordinarily difficult to arrive at a total for the sector because of the leak of trade statistics for services, and classification problems for electronic equipment.

1. Surplus

Our trade balance is significantly positive only in telecommunications equipment and possibly production of television advertisements. Our strength in telecommunications equipment is due to the technological leadership of Northern Telecom and a few other companies, and the fact that Bell Canada has bought largely from its own manufacturing subsidiary. There is a risk that our trade position will weaken significantly with customers being allowed to purchase their own terminal equipment, and Bell conceivably being required to divest its manufacturing subsidiary in the interests of competition. The basis for Canadian success in television ad production is less clear, although Canadian content quotas for programs played a role in ensuring that production facilities were established, and advertising production helps to maintain capacity utilization.

The trade balance may also be positive in the service bureau sector. However, reliable statistics are not available, and the amounts do not appear to be large. Canada benefits from the fact that our service bureau sector has apparently been stronger than that of the United States, particularly in remote batch processing. However, the on-line sector of the market is growing more rapidly, and the industry feels that its competitiveness is hampered by tariff and tax policies which tend to make equipment costs higher here than in the United States. There is also reason for concern about the possible economic impact of Canadian subsidiaries making use of computer services provided by foreign parent companies, although our report earlier this year emphasized that solid data is lacking.

2. Little trade

Many services and some products in the sector are not traded to any major extent because they have characteristics that make them inherently local. Mail, cable, library and local telephone services could hardly be anywhere but close to their customers. Newspapers have also tended to be local because of the importance of timeliness, transportation costs and the preference of most readers for local and regional news. Moreover, retail and classified advertising, which are well suited to the print media because of their relatively high factual content, are addressed primarily to local and regional markets. The categories of television programs where Canadian production has been most successful commercially - news, public affairs and sports - share some of the characteristics of newspapers, as well as relatively low production costs. The development of customized computer programs also tends to be done near the client because of the need for frequent contact with the user during both development and implementation. However, the transborder satellite issue illustrates the danger of assuming that products which are now inherently local will remain that way as technology evolves.

3. Deficit

In many parts of the sector, there is little or no economic reason why production needs to be carried out near the consumer. Transportation costs are not a major factor for products such as EDP equipment, TV programs, software packages or books. Where transportation costs and tariffs are more significant, as in sound recording, the content can be produced elsewhere with only the physical manufacturing done in Canada. Moreover, both cultural and high technology products tend to be characterized by high initial costs to develop the idea and produce the first few copies, then lower or even negligible costs to produce additional copies. The natural market therefore tends to be world-wide, except for language differences. However, if producers located in the largest international

markets enjoy some marketing advantage in their own countries, this will allow them to operate on a scale which makes it very difficult for producers in small countries such as Canada to compete.

None of this is meant to imply that Canada must necessarily be a net importer in these areas. Telecommunications equipment and television advertising production, where we are net exporters, are not that different from other products which we import. On a smaller scale, there is no overwhelming reason why we could not export other types of books as we do paperback romances. Moreover, to the extent that the market is on a world scale, it is conceivable that the positive export balance in only a few products could be large enough to cover a deficit in a far longer list of communications/information products and services.

Operations

1. Operating technology

The communications/information sector itself is becoming increasingly mechanized and technically sophisticated. This applies even to industries which are mature or actually in decline from a market standpoint. The on-line computers used to enter and edit telegrams are a particularly striking example. Some other areas where technology has or will produce major changes in operations are:

- . digital transmission, digital switching and fibre optic cables in telecommunications;
- . optical character recognition and mechanized sorting in the post office;
- . substitution of videotape for film in program production;
- . word processing and photocomposition in publishing, particularly of newspapers;

- . declining hardware costs for service bureaus and their customers, together with the growth of distributed processing; and
- . greater mechanization in the production of equipment. Japanese television production is a conspicuous example, but IBM is also emphasizing mechanization as its own strategy.

This increasing mechanization generally increases output per worker. However, capital/labour ratios in financial terms may not increase because of the rapidly declining cost of the equipment itself.

2. Fixed costs

High capital/labour ratios, and high fixed costs generally, are characteristic of telecommunication and cable systems. In these industries, the cost of establishing a network to cover the service area is high, but the cost of connecting another customer is relatively low. Additions to trunk and switching capacity also tend to be in substantial chunks, as do additions to the processing capability of service bureaus. As a result, incremental sales, particularly at off-peak hours, will tend to be very profitable, even if discounts have to be granted.

3. Skilled labour

The sector as a whole relies heavily on skilled labour. Some of these are technical skills, for example in equipment research and development; software development; installation, operation and maintenance of telecommunications equipment; and the technical side of program production. Some are creative skills, such as acting, writing, directing and editing. There are also positions which demand a delicate mix of business and technical or creative skills, such as film producers, technical sales people for equipment and commercial editors for publishing houses. On the other hand, parts of the sector provide considerable employment for the relatively unskilled, for example as mailmen, couriers, and computer operators.

Finances

Differences in market risk and cost structure mean that some industries within the sector require very different forms of financing from others. Telephone companies, with a very stable demand for their product and a large asset base as security, can rely heavily on debt financing. At the other extreme, a small company producing a handful of films faces very high market risks and may have virtually no fixed assets. It has no alternative but to seek equity financing, either in the open market or from a large corporation. Software houses and smaller, high technology companies have somewhat similar characteristics to film producers. Moreover, their growth may be so rapid that internal financing is insufficient even if profits are very healthy. Recent successful open market stock issues by Systemhouse and Mitel, as well as the sale of a 25% interest in Norpak to Noranda and CDC's investment in AES are all examples of equity financing in this part of the sector.

More critical financial problems may be faced by parts of the sector which operate at a loss and may have little immediate prospect for improvement. In cases such as the CBC and Canada Post, the government has so far been willing to pay the deficit. It has also provided a measure of assistance to smaller Canadian book publishers, and to certain equipment manufacturers such as Consolidated Computer and Electrohome.

Concentration

The degree of concentration varies widely across the sector.

At one extreme are the industries which are natural monopolies at least on a local basis - telephone, cable and to some degree postal service. These services tend to involve high fixed costs to establish the delivery network, and low marginal costs to serve additional customers. The company with the largest share of a particular local market will therefore enjoy a tremendous cost advantage over any competitor. However, this factor alone does not explain why these industries are concentrated on a national basis.

In many other areas of the communications/information sector, one might expect a fairly high degree of concentration because of the "portfolio effect". One of the basic strategies for reducing risk is to invest in a portfolio of different projects whose outcome is unrelated. For example, one might buy stock in a copper mine, a paper mill and a bank. While each of these investments may be risky, the chance of all of them failing is slight. On the other hand, the chance of extraordinarily high profits is less than if all the money were invested in a single stock.

The portfolio effect can be applied to reduce risk in industries such as feature film production, sound recording, book publishing, computer software packages and high-technology equipment. This provides larger firms and conglomerates with an obvious advantage in financing.

On the other hand, it may be difficult to hold a large firm together because of factors such as:

- . the individualism of many artistically and technically creative people;
- . the conservatism of many larger organizations;
- . the prospects of very high returns if an individual idea succeeds, something which the person who had the idea may regard as virtually assured; and
- . the ease of entry into these industries on a small scale, in many of them because production can be contracted out or facilities rented.

While these small firms can become established, and may be successful up to a point, they often have difficulty expanding because of lack of management skills, credibility in the market place and financial backing. This would appear to explain the pattern seen in several parts of the sector where many small firms co-exist with a much smaller group of major companies which account for the bulk of revenues.

DEPARTMENT OF COMMUNICATIONS
 FRAMEWORK STUDY
 RANGE OF FINANCIAL INTERESTS OF SOME MAJOR
 CANADIAN COMMUNICATIONS/INFORMATION COMPANIES*

1. Baton Broadcasting - television and radio broadcasting, program production (through Glen-Warren), printing and business forms (through C.F. Houghton and ABF), and master antenna systems;
2. Bell Canada - telephone service in Ontario, Québec, and through affiliates in the Atlantic Provinces, telecommunications equipment (through Northern Telecom), telecommunications research (through Bell-Northern and B-N Software Research), electronic office systems (through Data 100 and Sycor in the U.S.), directory publishing (through Tele-Direct), printing (through Ronalds-Federated), consulting (through Bell Canada-International), satellite communication (through its minority interest in Telesat), and electronic information services (through the page creation operations of Tele-Direct);
3. Maclean Hunter - 75 business and professional publications, The Financial Post, consumer magazines (including Chatelaine and Maclean's as well as special-interest magazines), conferences, business directory publishing, computerized financial information (The Financial Post Investment Databank), commercial printing (including catalogues), radio and television broadcasting (through CFCN Communications and Key Radio), cable television in Canada and the U.S., business forms, paging, two-way radio, telephone answering, trade shows, book wholesaling, press clippings, leasing of circulation lists, market surveys, telephone marketing and microfilm services;
4. Rogers Cablesystems - cable systems in Canada and the U.S., pay television in the U.S. and Canadian hotels, and on-line data processing;
5. Southam - daily newspapers; trade magazines, bookstores (through Coles); electronic information services (through Infomart); radio and television broadcasting (through Selkirk Communications), cable television in Canada and the U.S. (also through Selkirk subsidiaries), sound recording (through Quality Records), two-way cable equipment (through TOCOM), and broadcast news services;
6. Standard Broadcasting - radio and television broadcasting, music publishing, television program production, broadcast news service, recording studios, cablevision systems, and marketing of sound equipment;
7. Thomson Newspapers - 44 daily newspapers and 12 weekly, bi-weekly and tri-weekly newspapers in Canada, plus 67 daily and 5 weekly newspapers in the United States. The Thomson family also has extensive interests in broadcasting and books publishing, largely outside Canada, and in retailing and petroleum;
8. Torstar Corporation - daily newspaper (Toronto Star), weekly newspaper (through Metropan and Inland), commercial printing, book publishing (Harlequin), magazines (Homemaker's, Madame au Foyer, Quest, City Woman and The Canadian), electronic information services (Infomart) and program production (Nielson-Ferns).

* Information obtained from the Financial Post Corporation Service in most cases.

There are other forms of concentration which are less readily explained in terms of operating cost savings or risks - the growth of newspaper chains, large cable companies such as Rogers Cablesystems, telephone companies stretching far beyond local markets and multi-media companies. Exhibit 4 opposite illustrates the range of some of these companies' financial interests.

One simple explanation for the growth of these large companies is that there were firms in the sector whose cashflow exceeded the reinvestment needs of their own operations. This is particularly likely when an industry approaches maturity. It would be normal for such a company to seek investment opportunities in other parts of its industry, or in similar industries where growth prospects appear better. The linkages discussed in the next chapter suggest that some economies may also be possible through cross-media ownership. To the extent that media such as broadcasting, newspapers and electronic information services are in competition for the same markets, a company may also wish to hedge its bets by being involved in all of them.

Vertical integration has also been a conspicuous factor in the sector, specifically in telecommunications equipment and television program production. In both cases, vertical integration arose at a time when the number of potential customers within Canada was very limited (oligopsony). Moreover, the operations of those customers depended very heavily on buying material of acceptable quality and price, so it is hardly surprising that they established their own sources of supply. Whether circumstances have changed in such a way that vertical integration is no longer in the public interest is another question.

Ownership

The public sector has a very significant ownership stake in the sector, although it has shied away from the publishing component. Various levels of government control telephone companies (in all three Prairies provinces plus municipal systems in Edmonton and Thunder Bay), Teleglobe, the Post Office, broadcasters (the CBC, TV Ontario and Radio-Québec), the National Film Board and numerous librairies, and hold major interests in Telesat, CNCP Telecommunications, Consolidated Computer and, through the CDC, in AES and other office automation equipment companies.

The federal government has preferred to leave much of the broadcasting industry and cable systems to private ownership. However, it has required that this ownership be primarily Canadian.

In other parts of the sector, Canadian ownership prevails, though there is no obvious reason why it does so. This is true of telephone companies, newspapers, computer service bureaus and software houses, for example.

On the other hand, foreign ownership dominates where the importation of content or equipment from abroad is a major element of Canadian operations. This is true of EDP equipment, film distribution, distribution of mass-market paperbacks and magazines, sound recording, and to some degree of book publishing.

Geographical Distribution

Proximity to markets appears to be the most important locational factor in the sector, with resources having virtually no impact on where operations and management activities are located.

The market factor is most evident in those industries which we previously described as inherently local, such as telephone, cable, postal service, newspapers and custom computer programming. Just as international trade is minor in these industries, so are their operations widely dispersed across Canada.

Another set of industries tends to be highly concentrated, but in metropolises which serve as market centres, and are seen more broadly as cultural centres. Once concentration has begun, a pool of experienced people is also built up which becomes difficult to match elsewhere. For this reason, program production, book and magazine publishing and sound recording are heavily concentrated - in Toronto for the English language and Montréal for French. Some activity also takes place in Vancouver, and the CBC has attempted to decentralize production of national programs as a matter of policy.

The service bureau industry also tends to be concentrated in Toronto, Montréal and Ottawa. In this case, firms attempt to locate at a central point in order to minimize communications costs. There may also be marketing advantages to locating close to potential customers.

High technology industries such as communications/information equipment need not be located close to markets or raw materials, since they are characterized by a high value-to-weight ratio. On the other hand, Silicon Valley in the U.S. and Ottawa demonstrate that the industry tends, at the beginning, to cluster in an area where there is a critical mass of highly trained technical people. As the manufacturing process becomes more routine, government grants and labour costs may be key locational factors. For example, Mitel has announced plans to build plants with DREE assistance at Renfrew and in eastern New Brunswick.

Government Involvement

Various levels and agencies of government in Canada have policies affecting every component of the communications/information sector. The objectives of these programs, the types of instruments used and the resources devoted to them vary widely. In an attempt to gain a more coherent view of these governmental activities, we have developed a classification scheme reflecting:

- . the agency responsible (Department of Communications, CRTC, etc.);

- . the type of instrument (e.g. rate regulation, government purchasing or tax incentives);
- . the apparent objectives (divided into economic development and other, and then sub-divided into 11 categories); and
- . cost, either annual or non-recurring as appropriate.

The current draft is included as Appendix 3. The collection and checking of data for this matrix has not yet been completed, particularly in the equipment component where a variety of new programs have been established in recent years. The framework itself may also be modified as more data is gathered. However, the following impressions are beginning to emerge:

- . until recently, government involvement has focussed on the message transmission, program distribution, program production and, to some extent, the publishing components. Involvement in equipment has increased in recent years, but in computer services it remains minor;
- . economic development of the sector, in the sense of establishing enterprises which will be self-sustaining financially without ongoing support or protection, has not been a primary objective in most cases;
- . financial resources have been focussed on mature rather than growing parts of the sector. Specifically, subsidies to the CBC, Canada Post, and to the publishing industry through postal rates and tax exemptions have accounted for the lion's share of federal expenditures in the sector; and
- . measures to encourage television program production have focussed on distribution, both by ensuring that broadcasters provide air time for Canadian productions and that they have the financial resources to devote to it.

The protection of intellectual property through patent and copyright is of critical importance in much of the sector. This is because the up-front costs to develop a product, put it into commercial production and develop the market are substantial in much of the sector, and there is considerable risk that sales will be disappointing. On the other hand, the

marginal cost of producing copies of the product may be very low. Computer software packages, films and TV programs, are extreme examples, but the point also applies in some measure to books, records and high technology equipment. Unauthorized copying or imitation of successful products is therefore a constant threat to the incentive for original production. The government itself has faced this difficulty with respect to Telidon and to ensuring benefits to Canada if the product is successful.

4. LINKAGES

Interdependence, even among industries which are in some respects competitors, is a critical feature of the communications/information sector. At this stage in our study, we have not attempted to quantify these linkages, and in many cases statistics may not be readily available. However, the importance of these linkages often goes beyond the dollar amounts involved. For example, it is doubtful that service bureaus would exist at all without reliable data communications, even though those costs are only a few percent of their total budgets.

The linkages can be grouped into four categories:

- . product delivery;
- . marketing;
- . content source, and
- . equipment.

Product Delivery

The product delivery function in its simplest form is performed by common carriers, such as the telecommunications companies and the post office, which will transmit a virtually unlimited number of messages on a fee basis for anyone. These channels can be used by other companies in the communications/information sector to deliver their product or service to end users, rather than establishing their own delivery system. Examples include:

- . remote computing and electronic information services, which rely on the data transmission facilities of the telecommunications companies;
- . magazines and to some extent newspapers, delivered to subscribers by mail;

- . books delivered by mail, for example for book clubs;
- . telegrams delivered orally by telephone and in hard copy through the mail. There are also hybrid telegraph/mail services such as Telepost and Intelpost;
- . CNCP long distance data communications services, which under the CRTC's decision on interconnect can be delivered using the local loops of Bell Canada.

The same facilities are also used to deliver intermediate products.

Examples are:

- . network television programs transmitted to individual stations by microwave and satellite;
- . long distance calls transmitted for the telephone companies by satellite operators, i.e. Teleglobe and Telesat;
- . news service copy, including photographs, transmitted to newspapers and broadcasters by wire; and
- . newspaper final copy, transmitted via satellite for remote printing, as in the case of the Globe and Mail.

Cable companies provide a somewhat similar type of delivery service in extending the geographical coverage of television stations. However, this is a mixed blessing from the standpoint of the broadcaster, since cable companies also import competing stations into his own local coverage area. The cost of this delivery service has therefore been borne directly by consumers.

Broadcasters may also be thought of as delivering the output of program production companies to viewers. However, program delivery capacity is limited by economic, regulatory and to some extent technical factors. The broadcast licence holder therefore assumes the functions of selecting programs, arranging them in a schedule, and selling advertising time to

finance his program purchases and other costs. The broadcaster may also carry out a substantial part of the program production function himself, either directly or through a subsidiary.

The delivery functions of movie theatres, bookstores and newsstands are somewhat similar to those of broadcasters. Economic factors limit the number of movie screenings and the shelf space in bookstores and newsstands, so a selection of content is made. However, there is generally a sharing of risks with the publisher through the right to return unsold copies or with the film producer through a sharing of box office receipts.

The delivery services of the post office are also used extensively in the administrative operations of other communications companies, for example:

- . billing and payment for telephone service;
- . billing and payment for cable service; and
- . subscription correspondence for magazines and book clubs.

Marketing

As indicated in the preceding chapter, many communications/information products and services repay substantial marketing effort, and consumers also have a high degree of interest in product information.

In parts of the sector, a company can use its own output as an advertising vehicle - television stations advertising coming programs, cinemas providing samples of coming attractions, magazines promoting subscriptions, and mass market paperbacks with order forms for similar books.

Many outputs are also advertised through other media. In some cases, the message is directed to a broad public, for example television advertising for long distance telephone service or for records by companies such as K-Tel, or telephone promotion of newspaper subscriptions. In other cases, a particular medium may be ideal as a method of reaching a specialized group - EDP trade magazines for software packages and computer equipment, special interest consumer magazines or their mailing lists for book clubs specializing in that field, or television for selling TV sets and VCR's.

What is remarkable, however, is that the consumer's desire to know about certain communication/information products is strong enough that other media will provide that information to consumers without charging the company whose product is, in effect, being promoted. Newspapers provide listings of television programs and weekly television supplements. There are paid circulation magazines devoted entirely to television listings and more specialized magazines about films, books and records. Newspapers and magazines provide reviews of films, books and records. There is also an element of product information, though less explicitly, when television stations interview authors, musicians and film stars and when radio stations play new records. However, this kind of activity blends into our next category, where one medium is a source of content for another.

Content Source

There are a number of instances where the product of one industry can be used directly as content in another, either in whole or in part:

- . playing of records by radio stations;
- . showing of films over television;
- . sale of sound track recordings from films;
- . selection of newspaper articles by clipping services, or through more sophisticated electronic services such as Infoglobe;
- . paperback versions of hard cover books; and
- . library lending of books, magazines, newspapers and in some cases records and films;

In other cases, the output requires considerable adaptation to a different medium, for example:

- . movie, television and more recently audio cassette adaptations of books;
- . books versions of movie scripts;
- . magazine and newspaper excerpts of books;
- . dubbing of film and television programs into other languages; and
- . translation or adaptation of books.

These various "subsidiary rights" possibilities have led in recent years to sophisticated merchandizing campaigns where each version of the product helps to promote sales of the others.

News services are a more complex case since they are designed as a source of content for both print and broadcast media, as well as being delivered directly to end users in certain cases such as the Dow Jones News Service and the news channel provided to some cable companies by Broadcast News.

Equipment

Communications/information companies require a wide variety of equipment for their own operations, much of it highly sophisticated. Examples include telephone switching equipment, communications satellites and earth stations, optical character recognition and encoding equipment for mail sorting, television and motion picture cameras, broadcasting antennas, coaxial cable trunks and drops, computers for library catalogue and bibliographic information services, word processing equipment for text editing, high speed printing presses, and of course the EDP equipment used by service bureaus.

Many communications/information products and services also require the customer to have equipment on his own premises, whether owned by him or by a service supplier. Examples include television and radio receivers, telex terminals, telephones, computer terminals, and playing equipment for records, audio and video tapes and videodisks. Moreover, the use of computer software packages pre-supposes appropriate computer equipment.

The equipment component has a broader impact because it carries out much of the research and development function for other components. This can result in new products such as television, which spawn new industries for both carriage and content, or major changes in operating technology for existing industries.

5. MESSAGE TRANSMISSION

Description

Telephone companies make up by far the largest part of the message transmission component, with operating revenues in 1979 of \$5,151 million.* This is more than three times the operating costs of Canada Post, which were \$1,594 million in the 1978/79 fiscal year.** Other telecommunications carriers, including CNCP, Teleglobe and Telesat, had combined operating revenues of \$412 million in 1979, just 8% of telephone company revenues. According to estimates made in 1976, courier services had total revenues of \$55 million.*** Because of their relatively small size, and the lack of readily available data, we have devoted little attention to courier services.

Canada Post is more significant in terms of employment, with full-time strength of 53,100 at March 31, 1979.** This is equal to 55% of telephone company full-time strength, which was 96,500 at December 31, 1979.* Other telecommunications carriers employed 7,200.**** While we have no data on courier services as yet, their operations appear very labour intensive, so they may be more significant in terms of employment than revenues.

Markets

At first glance, telecommunications appears to be a mature industry. Bell Canada has been in operation for over 100 years, and commercial telegraph service is several decades older. Virtually every business and residence in Canada has at least one telephone, except in very isolated areas. Telegraph service has even passed into the decline phase of product life cycle, with the number sent declining by 71.7% from 1970 to 1979.*

* Statistics Canada Catalogue 56-203, Annual.

** From a statistical summary published by Canada Post, 1980.

*** Information detained from a client in the course of a previous study.

**** Statistics Canada Catalogue 56-201, Annual.

However, demand for many telecommunications services continues to grow rapidly, as the following statistics indicate:

- the number of telephones per 100 population rose from 45 in 1970 to 67 in 1979, an increase of almost 50%;*
- during the same period, the total number of business telephones increased by 66.8%, and residence telephones by 60.6%;*
- the number of long distance calls grew by 164.1% over the period 1970-1979, and 11.8% in 1979 alone;*
- the growth of overseas long distance calls has been even more rapid, in part because of the introduction of overseas direct dialing. Bell Canada reports an increase in overseas calls of 22.7% for 1980;***
- data transmission volume is difficult to estimate, but industry sources believe that it is continuing to grow at 20% or more a year; and,
- demand for mobile telephone and paging services is also reported to be growing rapidly, despite constraints of frequency availability.

Postal service might be thought of as being in decline because significant segments of the message transmission market have been lost over the years to the telephone and on a smaller scale to courier services. However, the growth of information transfer demand as a whole has been such that postal volume has continued to increase substantially, despite the apparent reduction in market share. Total mail volume grew from 5.0 billion pieces in 1975/76 to 6.1 billion in 1978/79, while first class volume rose from 3.2 to 3.7 billion pieces.****

* Statistics Canada 56-201, Annual.

** Statistics Canada 50-203, Annual.

*** Response to Interrogatory Bell (ONT) 17 March 81-108 in connection with CRTC hearings.

**** From a statistical summary published by Canada Post, 1980.

Key factors in demand appear to be convenience, cost and, for certain purposes, the existence of a hard copy record. Convenience and cost are influenced in turn by the extent to which a particular method of message transmission is incorporated into the standard operating procedures of a business, or the habits of a household.

Trade

Trade in message transmission services has been virtually non-existent in the past. The pick-up and delivery of messages, whether on paper or through telecommunications circuits, is an inherently local activity. Long-distance transmission between two points within the same country has generally been carried out over domestic routes, both because that would generally be the shortest path and also because dependence on communications lines across another country would raise issues of national security and economic sovereignty. Arrangements do, of course, exist for long-distance transmission between points in different countries, but these do not involve an export or import of services because the revenues are split between the sending and receiving countries.

Communications satellites make distance less significant in telecommunications costs, and raise the threat or opportunity that a satellite controlled by interests in one country could be an economically competitive means of transmitting voice, data or video signals between points in another country.

Expertise in telecommunications is also exportable, as demonstrated by the activities of Bell Canada International and particularly their recent contract with Saudi Arabia.

Operations

Major technological improvements such as digital transmission, digital switching and optical fibre cables are being introduced into the telephone system to increase capacity, reduce unit costs and facilitate the handling of data and video traffic as well as voice. There is also the prospect of greater use of satellites, which now serve primarily video and overseas traffic. However, implementation of these new technologies is likely to be gradual because of the amount of long-lived plant in place, and because they may not be economic in all cases.

The telephone industry is very capital intensive, with net plant of \$132,300 per full-time employee in 1979, or \$806 per telephone.* Technological change seems likely to further increase capital intensity.

The post office remains very labour intensive, despite the mechanization of letter sorting activities. In 1978/79, salaries and benefits accounted for 75.7% of the operating expenses of Canada Post.** Moreover, most of this employment was in relatively unskilled jobs.

In telecommunications, there is a much greater need for skilled personnel and for continuing education as technology changes. Much of this training is apparently carried out in-house, although we were told that telecommunications companies in rapidly growing areas recruit personnel from other carriers. With respect to new services, software development personnel are apparently both critical and scarce, a problem which is shared by the computer services component.

* Calculated from Statistics Canada Catalogue 56-203, Annual.

** From a statistical summary published by Canada Post, 1980.

Finances

Profits in the telephone industry are controlled through the regulation of rates, and are therefore relatively moderate. Statistics Canada data indicates that after-tax profits for the industry as a whole were 9.9% of net worth in 1979.* On the other hand, profits are relatively secure because most telephone services are provided on a monopoly basis and demand shows little sensitivity to economic cycles.

Financial leverage tends to be high in the telephone industry with long-term debt equal to 118% of net worth. This is not surprising given the capital intensity of the industry, the stability of its revenues and the impact of rate of return regulation on the availability of equity capital.

The financial situation of Canada Post is very different because it was until recently a government department. Rates have not been raised rapidly enough to cover increased costs, and the deficit was equal to 30.5% of operating expenses in 1978/79.** Moreover, capital expenditures have been expensed rather than financed through borrowing by Canada Post.

Prices for telephone services have risen much more slowly than the cost of living generally, going up only 34.6% from 1971 to 1980.*** Rate increases for telex are also said to have been well below the inflation rate. This low rate of increase appears to be due largely to the introduction of new technology which has raised capacity and permitted employment to grow much less rapidly than output. The existence of long-term debt issued when interest rates were far lower may also be a factor. Interest expenses were equal to 11.6% of operating revenue for all telephone companies in 1979.*

* Statistics Canada Catalogue 56-203, Annual.

** From a statistical summary published by Canada Post, 1980.

*** From a Bell Canada internal report.

Concentration/Ownership

The message transmission component is characterized by a very high degree of concentration, although some aspects are becoming more competitive.

The public switched telephone service is a natural monopoly on a local basis because of the low marginal cost of connecting additional subscribers to trunks, and the desire of customers for access to the maximum number of other subscribers. Concentration is also very high on a national basis as the following figures for 1978* illustrate:

Bell Canada and affiliates	67.0% of telephones
GTE subsidiaries	12.0
Provincial Crown corporations	14.3
Other	6.7

The telephone companies are also tied together through the Trans-Canada Telephone System (TCTS), a voluntary association which ensures integration of the telephone network as a national basis and administers the sharing of inter-carrier revenues.

With respect to other telecommunications services, CNCP has a practical monopoly in telegraph service, a dominant position in Telex, and competes with the telephone companies in data communications, video transmission and private line services. Teleglobe has a monopoly of overseas telecommunications, and Telesat of domestic satellite operations. Telesat is controlled in turn by the telephone companies, who select a majority of the directors. Telesat is also linked to the telephone companies through its membership in TCTS.

The CRTC has encouraged a greater degree of competition in telecommunications by requiring Bell Canada to allow CNCP to interconnect in specified ways, and by requiring Bell on an interim basis to accept the attachment

* From a report by Arthur D. Little, Inc.

of customer-owned terminal equipment. There is also a threat of competition from American satellite networks established to serve the business-to-business market.

Bell Canada argues that such competition is not really economic, but that cross-subsidization mandated by the regulatory authorities creates niches which can be profitable for other carriers. CNCP representatives agree that long distance rates subsidize basic residential telephone service. However, they suggest that full and accurate costing of competitive services offered by the telephone companies would show that they are also cross-subsidized. This question is currently being examined by the CRTC.

The telephone companies also have a long established pattern of vertical integration. Bell Canada, for example, has interests in telecommunications equipment manufacturing, directory publishing, printing, and consulting. The desirability of such vertical integration is being examined by the Restrictive Trade Practices Commission.

Postal service is a legal monopoly, and would appear to be a natural monopoly at least where service to residential areas is concerned. However, it has been argued that some large volume mailers could deliver their own mail more economically than Canada Post in urban areas. These mailers would not have to carry the cost of pick-up, counter service or the cross-subsidization of operations in non-urban areas. In the business-to-business market, courier services compete on the basis of speed and reliability, which appears sufficient to justify premium prices relative to postal service.

Ownership of message transmission companies is overwhelmingly Canadian, with the GTE subsidiaries, B.C. Telephone and Québec-Telephone, being the major exceptions. Various levels of government also play a major role, through Alberta Government Telephones, Saskatchewan Telecommunications, Manitoba Telephone System, Edmonton Telephones, Teleglobe Canada, Canada Post and interests in CNCP Telecommunications and Telesat.

Geographical Distribution

Telecommunications and postal services are available in some form virtually throughout Canada, although quality and convenience may be less than in urban areas because of multi-party lines or absence of home delivery. Upgrading of telephone service in non-urban areas is the subject of major capital investment programs by the companies.

Employment in all aspects of message transmission is widely dispersed geographically because of the importance of pick-up, delivery, installation and maintenance functions. Managerial and staff employment is also relatively dispersed because of the ownership structure of the telephone companies and the decentralization policy of Canada Post.

Government Investment

The message transmission component is highly regulated, with a mixture of federal and provincial jurisdiction.

Telecommunications rates are established so as to achieve an overall rate of return which is considered reasonable by the regulatory body, but the price of any specific service may not be closely related to its cost. In particular, basic residential service, especially in rural areas, is cross-subsidized. This is considered a matter of social equity since having a telephone has come to be regarded as a necessity. On the other hand, low rates for basic service have presumably encouraged high market penetration, making the telephone more attractive to those interested in reaching households.

The selection of appropriate formulas for evaluating actual and required rates of return has naturally been a matter of controversy. One current issue is the inclusion of non-telephone service revenues, such as Bell's

contract with Saudi Arabia, in rate of return calculations. The alternative of allocating costs and assets between regulated and unregulated operations would give rise to another set of issues.

Postal rates have traditionally been established by the federal government, which also pays the resulting deficit. Preferential rates have been established for periodicals, books and records. Here again, there is controversy over the allocation of costs and hence the true extent of subsidization.

6. PROGRAM DISTRIBUTION

Description

The program distribution component of the communications/information sector consists of:

- . television stations and networks;
- . radio stations and networks;
- . cable systems;
- . motion picture theatre; and
- . distributors of films and videotapes.

Distribution can be distinguished conceptually from program production, but separate statistics are often not available because much of the program production in Canada is undertaken by television networks.

Television broadcasting is the largest single industry within the component, as the following table, based on data for 1979*, illustrates:

	<u>Operating Revenue</u>	<u>Employment</u>
Television *	\$562	27,675
Radio *	357	
Cable systems	310	5,600
Motion picture theatres	277	7,279 full-time
Distribution of film and video-tapes	210	729

* Statistics Canada Catalogue 50-204, 56-205 and 63-207
Excludes governmental appropriations for the CBC, which
were \$562 million in 1979.

Markets

The major methods of program distribution all appear to be in or approaching the maturity phase of the product life cycle. Penetration of the household market is virtually complete for both radio and television, and by 1979 some 68.7% of households passed by cable and 52.9% of all households were subscribers.* Over the ten years up to 1979, revenues grew at an annual rate of:

- . 9% for motion picture theatres;**
- . 12% for radio broadcasters***, with FM a small but growing segment;
- . 16% for television broadcasters***, although per capita viewing time has changed very little;
- . 26% for cable systems,* although this had decreased to 15% for the year 1979.

We are yet to see sales statistics for pre-recorded video-cassettes and videodiscs, but it is evident that both products are still in the introductory phase and their long-term prospects are uncertain. Pay television is yet to be introduced in Canada, although the CRTC has called for and received a large number of applications.

The average Canadian watches 23 hours of television per week.**** Although virtually everyone watches some television, there are substantial variations in viewing time depending on:

- . season, with viewing time 23% above the annual average in January and 23% below in July and August;
- . sex, with women, particularly those without paid jobs, watching substantially more than men;

* Statistics Canada Catalogue 56-205, Annual.

** Statistics Canada Catalogue 63-207, Annual.

*** Statistics Canada Catalogue 56-204, Annual.

**** This and other figures on viewing habits are from an internal CBC research report based on a variety of public sources covering the 1979-80 season.

- . age, with those over 60 watching substantially more and those 18-24 substantially less than average. Contrary to what one might expect, children watch fewer hours of television than adults;
- . education, with adults with no high school watching over 30 hours per week compared to 16 hours for those who completed university;
- . time, with 58% of weekday viewing concentrated between 6 and 11 p.m.

The growing number of stations and the penetration of colour TV, cable, converters and second TV sets do not appear to have increased the amount of time spent watching television.* Instead, they have resulted in an increasing fragmentation of the television audience. This fragmentation is likely to grow with the introduction of pay TV, possibly direct broadcast satellites, and broadcast TV substitutes such as prerecorded video-cassettes and videodiscs.

Radio broadcasting differs from television in that stations in major cities differentiate their product, largely by specializing in a particular type of music. Such differentiation is required by the CRTC, as well as responding to commercial imperatives. Different audience profiles in terms of age and other demographics are critical in competing for advertising revenues with other stations and with daily newspapers which generally attempt to cater to the whole population.

Cable television has achieved high market penetration in Canada based on its ability to provide additional channels, particularly from the U.S. Cable systems do offer other services such as local programming, FM radio and simple teletext-type material such as weather reports. However, these do not appear to attract large audiences or additional subscribers.

* From an internal CBC study.

The number of cable subscribers grew at annual rates of over 20% up to 1973, but by 1979 had slowed to 8.2%.* Growth in many well-established systems is likely to be much lower. Many cable operators are therefore interested in the growth potential offered by:

- . pay television, including the possibility of the cable companies assuming a programming as well as a distribution role; and
- . non-programming services including videotext, interactive polling, telemarketing, electronic banking, fire and burglary alarms and automatic utility reading.

Motion picture theatres remain a well-established part of the program distribution sector in Canada, although their importance has diminished greatly since the introduction of television. The total number of paid admissions in 1979 was 98 million**, which indicates that the average Canadian goes to 4.3 movies per year. However, attendance appears to vary widely within the population, people in their teens and twenties being the major market.

Broadcasters, both radio and television, derive their revenues almost exclusively from the sale of air-time to advertisers. Radio is largely a local advertising medium (72.9%), while television advertising revenue is predominantly national or network (75.0%), according to figures for 1979.*** CBC television is even more strongly oriented to national or network advertising, with 88.4% of its advertising revenue from this source.

Cable systems and movie theatres, on the other hand, derive their revenue directly from users in the form of subscriber fees and admissions. In the case of motion picture theatres, refreshment sales account for one-fifth of the total.

* Statistics Canada Catalogue 56-205.

** Statistics Canada Catalogue 63-207, Annual.

*** Statistics Canada Catalogue 56-204, Annual.

Trade

Trade occurs largely at the level of program production, with imported television programs and films comprising a major proportion of the content distributed in Canada.

Imports of program distribution services take the form of advertising by Canadian businesses on foreign stations, which continues to some extent despite tax disincentives, but for which we do not yet have figures.

Viewing of U.S. television stations offair or via cable, is not an import, strictly speaking, since no direct payment is involved. However, it has an economic impact in that it reduces the audience that Canadian broadcasters can offer to advertisers. CBC statistics for the 1979-80 season indicate that U.S. stations accounted for 29% of all viewing of English-language stations, or over 23% of total viewing.* CRTC figures indicate that U.S. radio stations, on the other hand, attract few listeners in Canada.** This is presumably because relatively low production costs enable Canadian stations to offer programming fully comparable to that of U.S. stations, as well as better reception and local content such as news and weather.

Exports in the area of program distribution, such as advertising by U.S. business on Canadian stations or viewing of such stations by individuals in the U.S., do not appear to be significant.

Operations

Cable systems are the most capital intensive aspect of broadcasting, with net fixed assets of \$300 million in 1979, compared to \$288 million in television and \$169 in radio***, which have more operating revenue.

The operations of cable systems are characterized by high fixed costs (trunk lines and head ends) and low marginal costs of increasing penetration (distribution cables). Industry sources indicate that, as of 1980,

* From an internal CBC study.

** Special Report on Broadcasting in Canada, 1968-78, CRTC.

*** Statistical Canada Catalogue 56-204 and 56-205, Annual.

the cost per mile for trunk lines is in the order of \$12,000. The fixed cost are further increased where microwave links are used to obtain signals from remote stations, for example, in Alberta and the Atlantic provinces. Cable systems are therefore capital intensive, with net fixed assets of \$45,800 per employee in 1977. This is equal to \$79 per subscriber.* However, these figures understate capital intensity, since poles and in some cases trunk lines themselves are leased from the telephone companies.

Broadcasting operations are difficult to separate from the associated production operations. They might be expected to be capital-intensive, and private broadcasters did have \$25.4 million invested (net of depreciation) in towers, antennas and transmitter equipment at the end of 1979. However, this compares to a net investment of \$46.4 million in studio and technical equipment.*

Employment by radio and television broadcasters is concentrated in the program category, which accounted for 17,283 employees or 62.4% of the total in 1979. Cable companies, on the other hand, had only 592 program employees in 1977, a 12.2% of their total staff. This is not surprising given that the cable companies acquire most of their programming off-air at no cost except for receiving equipment. Technical personnel represented 48.4% of the total for cable companies, compared to only 7.4% for broadcasters.**

Finances

Profitability in the program distribution sector appears to be healthy, except for the CBC which incurs a deficit equal to some 80% of its expenditures. Total profits for the private sector in 1979** were as follows:

Television	\$75 million
Radio	21
Cable systems	25

* Based on Statistics Canada Catalogue 56-204 and 56-205, Annual.

** Statistics Canada Catalogue 56-204 and 56-205, Annual.

Average profitability in radio tends to be lower than for television, reflecting a higher level of competition among stations as well as with other local advertising media such as newspapers.

Price-earnings ratios for major broadcasting companies listed on the Toronto Stock Exchange have tended to be higher than for the composite index^{**}, indicating that the market views earnings growth prospects for these companies as favourable.

Profits in the cable television industry were very strong during the 1970's, due in part to favourable rate decisions by the CRTC. In recent years, however, they have been weaker, declining from \$13.20 per subscriber in 1977 to \$12.14 in 1979.* This trend has occurred despite economies related to the greater number and density of subscribers. On the other hand, given that the industry is a local monopoly and is now well established, profits are relatively secure.

Concentration/Ownership

The program distribution component tends to be fairly concentrated, but the pattern is not uniform.

The television industry is dominated by two national networks - CBC and CTV. There are also smaller private sector networks which operate regionally, including ATV in the Atlantic Provinces and the French-language TVA in Québec. Networks have the advantage of spreading program production or procurement costs over a larger number of viewers and increasing bargaining power in procurement.

There are 356 radio broadcasting firms in Canada, compared to only 73 television companies.^{***} There is also a wider variation in firm size, reflecting differences between the two industries in economies of scale (due to relatively low program production costs in radio), market size and the number of positions available in the spectrum.

* Statistics Canada Catalogue 56-204 and 56-205, Annual.

** Toronto Stock Exchange index data cited in an internal DOC study, The Television Broadcasting Industry in Canada.

*** Statistics Canada Catalogue 56-204, Annual.

Although the CBC has extensive networks for both radio and television, it does not dominate broadcasting in commercial terms. This is due to programming decisions based partly on non-commercial considerations, some deliberate reductions in the amount of television advertising time, and the decision not to carry advertising on CBC radio. As a result, CBC received only 16.5% of television advertising revenue and 10.0% of total broadcast advertising revenue in 1979.*

Within the private sector, there are a number of companies such as Baton, Standard, Selkirk, CHUM and CFCN which own multiple radio or television stations. Various companies are also linked together through CTV, a cooperative network owned by its affiliates. However, no single company can be said to dominate commercial broadcasting.

In cable television, there were some 341 separate firms operating 482 systems in 1979***, but many of them are small. The high profitability of the industry, the gradual slowing in the growth of individual systems and the lack of attractive new franchise areas have encouraged a series of mergers. These include the take over by Rogers Telecommunications of Canadian Cablesystems and Premier Communications, and of Cablevision Nationale by Vidéotron. Rogers Telecommunications and its associates now account for 1.2 million subscribers in Canada**, or close to 30% of the total.

It seems unlikely that economies can be achieved at the local operating level through mergers, but corporate groups may have advantages in terms of:

- . expertise in dealing with government;
- . spreading of research and development costs, particularly with respect to new services; and,
- . possible economies of scale in the operation of new services.

* Statistics Canada Catalogue 56-204, Annual.

** The Financial Post Corporation Service Data as of August 31, 1980.

*** Statistics Canada Catalogue 56-205, Annual.

The motion picture theatre industry is dominated by Famous Players (Canada) Limited and Odeon Theatres, with 44% and 19% of gross revenues respectively. The leading position of Famous Players is said to be strengthened by preferential access to first runs of films produced and distributed by Paramount Pictures, Warner Bros., and United Artists.

With respect to the distribution of film and videotapes, there were 91 firms operating in Canada in 1978. The largest 7 of these accounted for 68.8% of the industry's operating revenues. The structure of this industry may, however, be revolutionized by the widespread sale of video-cassettes and videodiscs.

Barriers to entry into most aspects of program distribution are high. Radio and television stations as well as cable systems require licences. In the case of cable, these represent local monopolies, and the CRTC limits the growth of broadcast licences to protect the revenues of existing stations. The cost of meeting Canadian content quotas also represents a significant barrier for new television stations.

Ownership of broadcasting and cable systems is Canadian because of regulatory requirements. In 1968, before these requirements were extended to the cable industry, some 55.8% of cable operating revenues flowed to foreign-owned companies. More recently, Canadian cable companies such as Rogers and Maclean-Hunter have reversed the situation by expanding into the U.S., where cable penetration is much lower. No such Canadian ownership requirements apply to motion picture theatres, with the result that the largest chain in Canada, Famous Players, is owned by Gulf and Western, an American conglomerate.

Geographical Distribution

Radio and television broadcasts are available off-air to virtually all Canadians. According to figures for 1977, the proportions of Canadians with access to different categories of television stations were:

CBC	98%
Other Canadian	95
U.S. stations	73

This coverage was achieved by a total of 105 originating television stations across Canada. In the case of the CBC, there were also some 678 relay and rebroadcast transmitters.*

There is radio coverage in all but a limited number of isolated areas of Canada. Moreover, figures for 1977 showed that 98% of the population of English-speaking Canada had access to at least 4 English-language radio stations, and 97% of the population of Québec has access to at least 4 French-language stations. This coverage was provided by a total of 374 AM and 113 FM originating stations.* Broadcast coverage is, however, less satisfactory in terms of official language minorities, other language groups including native peoples and small communities in remote areas.

Cable television coverage is much less complete because the cost of installing trunk lines makes cable service economically attractive only where population density is fairly high. As of 1979, cable franchise areas covered 80.5% of all homes**, and this is not expected to increase dramatically.

There were some 1070 active regular motion picture theatre and 292 drive-ins in 1979.*** These theatres were well distributed across provinces, but it is evident that a certain concentration of population is needed to support a commercial theatre.

* Special Report on Broadcasting in Canada, 1968-78, CRTC.

** Statistics Canada Catalogue 56-205, Annual.

*** Statistics Canada Catalogue 56-207, Annual.

Government Involvement

Most of the program distribution component is highly regulated. Under the Broadcasting Act, the CRTC is responsible for the allocation of radio and television licences, which are issued for a maximum period of 5 years, and of cable franchises. It also establishes or applies policies with respect to such matters as:

- . ownership of broadcast and cable licences, including cross-ownership among media;
- . CBC affiliation where no CBC-owned station exists;
- . Canadian content in programs;
- . advertising time and content;
- . signal carriage priority and simultaneous program substitution on cable systems;
- . cable television rates;
- . cable hardware ownership;
- . community programming on cable; and,
- . non-programming services offered via cable television.

Governments are also involved in the operation of television networks such as the CBC, TV Ontario and Radio-Québec, as well as the CBC radio network and its overseas service. With respect specifically to distribution, CBC has received special funds from Parliament to extend services to smaller communities. The CBC is also involved in programming for special interest audiences, including native peoples.

Tax legislation also has an impact on the industry through the non-deductibility of advertising expenditures on U.S. stations.

While these policies bear directly on the distributor of programs, most of them are intended to stimulate program production in Canada, either directly or by protecting the revenue base of Canadian broadcasters.

Motion picture theatres are under provincial jurisdiction. Regulation has focussed on the acceptability of content, rather than where it is produced.

7. PROGRAM PRODUCTION

Description

The program production component consists of the following elements:

- . the in-house or associated production activities of television broadcasters;
- . independent motion picture and television program production firms; and
- . recording and duplication of records and audio tapes.

In-house television program production is by far the largest element, as the following figures for 1979 indicate:

In-house production	\$408 million (cost)
Sound recording	\$270 million (operating revenues)
Independent producers	\$ 99 million (operating revenues)

Markets/Trade

Canada's trade balance in program production appears to be heavily negative. An earlier report to the Department quotes the following figures:

	<u>Imports</u>	<u>Exports</u>
	(\$ million)	
Television programming	\$ 56	\$ 9
Feature films	75	15
Sound recording	103	5

Moreover, these statistics understate the extent of our dependence on imports because:

- . the prices paid for television programming are only a small fraction of its original production cost, largely absorbed by the U.S. market; and

* From Economics of the Program Production Industry by Nordicity Group Ltd., based on various other surveys and estimates. Figures for television programming are for 1979, the others for 1977. Reliability is unknown, but the figures for sound recording substantially exceed those quoted in another internal study, perhaps because of differences in definition.

- . many of the records manufactured in Canada are simply copies of U.S. recordings.

There is a marked contrast in the domestic success of different types of Canadian television productions:*

- . Canadian news, public affairs and sports make up 17% of the total English-language programming available to Canadians, and attract 19% of the audience. Foreign news, public affairs and sports programs attract only 5% of the audience;
- . Canadian drama, variety, music, quiz and other programs make up 16% of the programming available, but attract only 7% the total audience. Foreign programs in these categories account for 69% of total TV viewing;
- . on French-language television, Canadian programs attract 62% of the total audience, compared to only 26% for English-language television. However, French-speaking Canadians devote 19% of their viewing time to English-language television. Much of this is presumably for foreign produced shows.

The fact that Canadian production has been successful in news, public affairs and sports can be attributed partly to audience interest in events of a relatively local nature. Moreover, production costs for such programs tend to be relatively low**, so that Canadian networks are in a relatively good position to compete with their American counterparts on the basis of quality.

Canadian programming also faces the disadvantage of being shown outside the peak weekday viewing period of 7-11 p.m. Less than 25% of the programming available on English-language stations during this period is Canadian, compared to 33% for the schedule as a whole.* This is a form of vicious circle. Canadian programs have difficulty competing for audiences, so content requirements are met by showing them at times when there are fewer viewers to compete for.

* From an internal CBC study.

** "L'industrie de la production d'émissions de télévision au Canada".

CBC, which accounts for the lion's share of program production in Canada, has only had modest exports. The underlying reason is presumably that the limited size of the Canadian market, and the necessity of providing locally oriented programming such as news, public affairs and sports, make it difficult for the CBC to pay the cost of producing dramatic and other programs of international calibre. More specific considerations are that:*

- . international buyers consider that CBC drama and variety programming suffer from script limitations, slow pacing/editing, and lack of international stars; and
- . due to the CBC mandate, there has been a decrease in international themes in CBC productions.

The revenues of the independent program production industry in Canada are heavily oriented toward the production of television commercials and programs according to the following table:**

Television Commercials	\$39.4 million
Industrial & Educational Productions	28.9
Television Programs	25.8
Rental of Facilities	7.3
Features and Shorts	5.2
Distribution	3.0
Other Sources	<u>13.0</u>
TOTAL	\$122.6 million

Indeed, commercials are one aspect of broadcasting where Canadian content is very high. A substantial export market is also said to exist, though we are yet to obtain any statistics.

On the other hand, figures from an internal CBC study suggest that the independent production sector is much larger and more heavily oriented to theatrical production. We will be examining these figures further later in our study.

* Economics of the Program Production Industry, Nordicity Group, 1981.

** Unpublished results of 1979 Statistics Canada survey of motion picture production quoted in the Nordicity Group study.

Production of feature films in Canada has increased dramatically in recent years, but the following figures for 1979* show that it remains modest by world standards:

U.S.	330 films
France	134
Germany	29
Italy	28
Canada	24
Great Britain	11
Others	<u>106</u>
TOTAL	662

The production of television programs in Canada is generally carried out by the firms that broadcast them, ensuring at least domestic distribution. In feature films, however, production and distribution have generally been separated. Deals between producers and distributors are complex, and vary with each product. The situation in Canada differs from other countries where there is a tendency for producers and distributors to work together either formally or informally.

Independent producers of feature films have reportedly encountered difficulties in obtaining distribution for their products in Canada. Indeed, in 1978, Canadian productions accounted for only \$3.5 million or 2.9% of the revenues of film distributors in Canada.* Virtually all of this revenue was accounted for by Canadian controlled distributors.

It has also been suggested that Canadian produced films tend to suffer from inadequate budgets for promotion.

The limited size of the Canadian market means that exports are often essential in order to break even. In particular:

- the Canadian producer of theatrical films, educational and documentary films must, in the majority of cases, reach his break even revenue outside Canada, with domestic revenues seldom expected to exceed 50%; and

* Sources to be verified.

- the average sales of a record in Canada are estimated at 6,000 copies, compared to a break even point of 20,000 copies.

However, small independent producers of both films and records are likely to lack the resources for sustained international promotion.

Market prospects for the Canadian film and television program production industry are very uncertain at this point. The private sector has had some success in establishing its credibility, and the government is committed to encouraging its growth. However, the advent of pay television and of broadcast substitutes such as video cassettes and video discs will tend to further fragment the already small Canadian market. While Canadian content rules could be applied to pay television, the widening range of program options available to Canadians makes it more and more difficult to influence what is watched by controlling what is shown.

These same technological changes will tend to fragment the program market in other countries, including the U.S. where it has been largely controlled by the three major networks. Canadian productions may be able to compete in specialized niches of a less monolithic American market.

It has also been suggested that if the program market becomes more internationalized, American firms will seek higher prices for Canadian distribution of their programs. This would be on the basis that international sales would no longer be seen as pure profit after the cost has been absorbed in the major domestic market. If this hypothesis is correct, it would help to make Canadian production more price competitive. On the other hand, given the limitations of programming budgets, it might simply mean that Canadian broadcasters would have even less money left for Canadian content.

Although the sound recording industry in Canada is substantial, with sales of \$270 million in 1980 at distributors' net selling prices*, it is dwarfed by the American market. According to Billboard figures, retail sales of records and tapes in the U.S. in 1977 were 11.5 times as great as in Canada, and represented over half of the world market. Moreover, the Canadian market is divided into two linguistic groups, although 55% of the records sold in Québec in 1975 were English, according to figures gathered by the Québec Department of Cultural Affairs. The sound recording market is relatively narrow, with the majority of sales to people aged 18 to 34.**

Sound recording is characterized by high operating leverage, or in other words high set up costs and relatively low variable costs for producing additional units. The actual costs of production are in the order of one sixth of the retail price. The release of an individual record is said to be very risky, with only one in twenty albums passing the break even point of 20,000 units.**

The primary element in the promotion of records is radio airplay, which is sought through distribution of free copies and personal selling to stations, program directors and disc-jockeys. Airplay for Canadian records was difficult to obtain until the CRTC established a minimum Canadian content of 30% for AM radio, in part because Canadian stations tended to take their cue from the U.S. market in selecting material. Tours by recording artists, including interviews with local radio stations, are also useful in promoting record and tape sales. Television advertising is not generally used, except by certain specialized firms such as K-Tel.

The net value of domestic sales of sound recordings produced in Canada has increased rapidly in recent years, in part because of price increases. The increase was 41.1% from 1977 to 1980 according to Statistics Canada

* Statistics Canada Catalogue 47-004, Monthly.

** Figures quoted in an internal Arts and Culture Branch report on the sound recording industry.

figures, and 332.4% from 1970 to 1980.* However, the industry is concerned that home taping, bootlegging and counterfeiting are cutting substantially into potential sales.

Imports of sound recordings exceeded exports by \$17.3 to \$2.9 million in 1977.** However, they represented only 8.4% of the apparent domestic market. This relatively high level of self-sufficiency is due to tariffs, which make it more economic to manufacture in Canada, even if the recording originates abroad. On the other hand, less than half the top 100 albums in Canada in 1977 met even the CRTC's relatively broad definition of Canadian content.

Operations

Some of the key points about the operational aspects of the program production industry which have emerged from our research to date are:

- experienced directors, writers and composers are scarce, due to the short history of most aspects of program production in Canada;
- video tape techniques for television and non-theatrical films have greatly simplified the production process compared to traditional films, and there is a steady trend in this direction;
- underutilization of capacity in independent film production because of ease of entry and variation in demand;
- most of the sector appears to be labour-intensive, although sound recording studios are an exception;
- dependence on external technical services has so far limited production risks;
- sound recording facilities in Canada are said to be excellent;
- most of the machinery and equipment required by the sector is imported, largely from the United States in the case of sound recording.

* Statistics Canada Catalogue 47-004, Monthly.

** Based on an internal Arts and Cultural branch report. Much higher figures are quoted in a Nordicity Group study.

Finances

Financial risks are greatest in the production of feature films, since the entire production cost is incurred before distribution begins, individual projects are large relative to the size of a firm, and commercial success is very uncertain. Cost control also represents a problem because of problems caused by weather, absenteeism of key individuals, and delays in outside services. On the other hand, successful feature films can be extremely profitable. As a result, feature film production is most naturally financed through equity.

Television commercials and programs are said to be the bread and butter of the industry, involving far less risk. However, competition in this restricted market is said to be intense.

In the sound recording industry, machinery and equipment can generally be financed through conventional channels such as chartered banks, but the speculative nature of the business makes working capital much more difficult to obtain. The industry is also characterized by a complex structure of advances based on conditional agreements between record companies, artists, publishers, royalty societies and agencies.

Pricing practices vary greatly between segments of the program production industry. In non-theatrical production, the rule of thumb is said to be a 100% mark-up over direct cost (material, filming and processing costs). In sound recording, the retail price represents roughly a 500% mark-up on direct production costs. Pricing of theatrical productions, and to some extent programs for the CBC, is less a matter of cost-based formulas than of the producer negotiating the best deal he can with the distributor.

Concentration/Ownership

The degree of concentration varies widely in the program production component. Television program production is highly concentrated in the sense that 94.6% of the expenditures for Canadian programming in 1979 were for in-house production, with the CBC alone representing 77.0% of the total.*

For independent motion picture and video tape production, barriers to entry are very low because it is possible to contract for filming, editing, processing and even studios. As a result, 232 film and 36 video tape production establishments reported to Statistics Canada in 1979. Of these, only 25 had revenues of over \$1 million.** Given the risks in the industry, most firms are diversified into several product lines.

The sound recording industry is relatively concentrated. There are seven major manufacturing firms which account for about 70% of the industry's sales.*** These firms are generally foreign owned, largely by United States interests. On the other hand, almost all of the recording studios in Canada are domestically controlled. Major recording companies tend to produce both records and tapes, and to be vertically integrated.

Geographical Distribution

Program production of all forms tends to be located in the major centres of Toronto and Montréal because of access to specialized services and to a pool of qualified manpower. For example*, of the firms engaged in the production of film and video tapes in 1978, 70% had their head offices in Ontario and 15% in Québec. Of the 27 sound recording firms reporting to Statistics Canada in 1980, 20 were in the Toronto area and 5 in Montréal.

* From Bélanger, Chabot et Associés, "Données Financiers sur la programmation Canadienne", a report for the Department of Communications, December 1980.

** Statistics Canada Catalogue 63-206.

*** From an Arts and Culture Branch internal study.

Government Involvement

The government has a major influence on the program production industry in Canada, both indirectly through regulation of program distribution and directly through:

- . the in-house production operations of the CBC;
- . purchases by the CBC from independent producers;
- . the production operations of the National Film Board;
- . the Canadian Film Development Corporation;
- . accelerated write-offs of investments in feature films and other productions; and
- . production activities of provincial educational television networks.

One segment where the government is not involved directly at this point is sound recording.

8. PUBLISHING

Description

The publishing component consists primarily of firms engaged in publishing newspapers, periodicals, books and directories. We also deal to a limited extent with libraries, bookstores and newstands, which provide distribution channels, and with the new electronic publishing or information retrieval industry.

In terms of revenue from Canadian production, newspapers are by far the major output of the component, as the following figures for 1978 illustrate:*

Newspapers	\$1,114.6 million
Books	261.9 million
Periodicals	232.3 million
Directories	181.1 million

It should be noted that newspapers are generally sold at retail by their publishers, whereas books and periodicals often pass through several levels of distribution whose margins would have to be added on to give a full picture of the economic significance of these products.

Libraries are also a major economic factor, with operating costs estimated by the National Library at \$450 million annually for all these with over 5,000 volumes. This would not include most in-school libraries and some smaller municipal libraries.

Markets

Publishing as a whole appears to be a mature industry. For example, daily newspaper circulation grew at only 1.7% annually from 1973 to 1979 according to figures from the Royal Commission on Newspapers, while Statistics Canada figures indicate that the revenues of book publishers grew at 12-14% a year from 1975 to 1978.**

* Statistics Canada Catalogue 36-203, Annual.

** Statistics Canada Catalogue 87-601, Annual.

Some segments of publishing appears to be growing more rapidly, however, such as weekly newspapers, tabloids, mass market paperbacks and special interest magazines. The electronic publishing industry is still in its infancy, although the National Library estimates that revenues of information retrieval services in Canada are growing at 20% per year. A recent Business Week article suggests that on-line computerized information services are already a billion dollar business in the United States, with revenues growing at 30% annually.*

Readership penetration is difficult to measure accurately, but is clearly lower than television or telephone penetration. According to a 1978 Statistics Canada survey of leisure activities, 83% of adults had read a newspaper in the previous week, and 58% had read a magazine.** Surveys in the U.S. apparently indicate that about half of the population had read a book during the preceeding year. However, even these figures may be overstated since Statistics Canada acknowledges that respondents may tend to exaggerate the extent to which they read.

There is a clear association between educational levels and readership. Of those with post-secondary education, 91% read newspapers and 73% magazines. The corresponding figures for those without post-secondary education are 80% and 53%.**

Advertising is the major revenue source for both newspaper and magazine publishers. For daily newspapers, it averages 80% of total revenue** and for paid circulation consumer magazines is said to be about 65%. Free circulation magazines and many weekly newspapers are entirely dependent on advertising. Because advertising is the major revenue source, economic pressures encourage publishers to minimize the percentage of editorial content and to reduce editorial costs in so far as this can be done without a major loss of readers. It should also be noted that consumers often buy newspapers and special interest magazines for their advertising rather than for editorial content. There are even some publications which consist entirely of classified advertising, yet which people are prepared to buy.

* Business Week, June 29, 1981, p. 80.

** Statistics Canada Catalogue 87-625.

The proportions of circulation accounted for by subscription as opposed to newsstand sales apparently differ greatly among magazines. In Canada, American magazines tend to be sold largely through newsstands, and Canadian-published magazines largely by subscription. From the publisher's standpoint, subscription sales are attractive both because they provide a steady circulation base and because the distributor's margin generally accounts for half of the newsstand price.

The book market is very different since revenue is derived entirely from the reader, and each book is to some extent a new product. One source suggests that only some 10-20% of books published in Canada make a substantial profit. Certain publishers such as Harlequin have, however, attained a high level of standardization in their product, which makes profitability more predictable.

A newly published book has only a very limited period to establish its success commercially because of the constraints of shelf space in bookstores and other outlets, the carrying cost of inventory and the practice of allowing retailers to return copies for full credit. In the case of mass market paperbacks, the time allowed may be as little as a few weeks. On the other hand, a book which becomes established as a classic may remain on the market for generations, providing a steady source of revenue to its publisher. Subsidiary rights for paperback and book club editions, excerpting in newspapers and magazines, publication in other countries and film and television adaptation provide additional revenue for books which are successful, or whose success is probable because of the author's reputation.

In this environment, publicity for newly released books is of particular importance. Paid advertising, however, appears to be less significant than reviews in newspapers and magazines, and media appearances and autographing sessions by the author. In the case of textbooks, free distribution of copies to instructors and personal selling are major factors.

Direct mail promotion also appears to be a growing element. This includes book clubs, organizations such as Time-Life and Reader's Digest which have established mailing lists and publish books with a broad appeal, and professional and other special interest books for which specialized mailing lists may be used.

Trade

Certain segments of publishing are inherently local:

- . newspapers, because of the importance of timeliness, transportation costs, and the preference of most readers for local and regional news. Moreover, retail and classified advertising, which are well suited to the print media because of their relatively high factual content, are addressed primarily to local and regional markets. The publication of the Globe and Mail by satellite represents an interesting attempt to reach a specialized audience whose interests are more national than local.
- . directories, because they are primarily a by-product of telephone service. Telephone directories have traditionally been local because of the greater frequency of local calling and the prohibitive size of a national directory. Moreover, the yellow pages are essentially a retail advertising vehicle.
- . libraries, bookstores and newstands are also inherently local because they are retail-type establishments.

Imports dominate those segments of publishing which are not inherently local. In particular, imports account for:

- . 72% of revenue from book sales, or 84% if one includes books* by foreign authors published in Canada and adaptations ;
- . 73% of periodical circulation revenues.** In terms of number of copies, however, Canadian periodicals dominate. The difference is accounted for by the lower prices of Canadian periodicals and the inclusion of free circulation magazines;
- . 80% of information retrieval service revenues, according to National Library estimates.

* Statistics Canada Catalogue 87-601.

** Statistics Canada Catalogue 87-625.

Exports, on the other hand, are relatively minor. In the area of books they were 28% of Canadian production in 1978*, but much of this was apparently accounted for by a single publisher, Harlequin. Exports of magazines and newspapers appear to be minor, with major Canadian publications such as Chatelaine making no attempt to sell in the United States.

Operations

One might be inclined to think of publishing as a labour-intensive, low technology component compared to other parts of the communications/information sector. There is an element of truth in this, but it should not be overstated.

Book publishing does tend to be labour-intensive because production itself is often contracted out and editing, marketing and fulfillment require considerable manpower and relatively little equipment. Daily newspapers and major magazine publishers, on the other hand, generally own their own high-speed presses, so their operations are more capital intensive.

Technological change has already had a major impact on publishing in the form of:

- word processors, which are now commonly used by newspaper reporters to compose and edit stories, and increasingly by book publishers. We understand that some authors are working on word processors themselves, and supplying publishers with cassettes rather than typed originals;
- photocomposition, which eliminates the typesetting stage in newspapers, reducing costs and speeding production;
- computerization of subscriber lists by periodicals, of fulfillment activities by book publishers, and of inventory management in bookstore chains. Computerized lists are also essential to the direct mail marketing of books;

* Statistics Canada Catalogue 87-601.

- library automation, both in terms of bibliographic and and catalogue information and circulation control;
- photocopying, both by libraries and individuals, which can have a significant effect on demand for originals in specialized areas such as scholarly journals;
- computerization of newspaper "morgues", such as the New York Times and the Globe and Mail, which then become a marketable service; and
- satellite transmission for remote printing of newspapers.

The most dramatic technological change which may occur in future is the growth of electronic publishing, although this may not be at the expense of traditional forms of publishing. There is also some discussion of the possibility that short print runs of books could be made more economical through the use of laser printers, which would eliminate the high set-up cost represented by typesetting, and through the adoption of smaller presses. Publishing for very narrow audiences might then become more feasible economically, provided that appropriate marketing and distribution methods could be found.

Labour supply does not appear to be a critical problem in the publishing industry, although individuals who combine skills such as business acumen and a flair for words may be inherently scarce. Shortages of EDP personnel may also slow the implementation of technological changes.

Finances

Some studies suggest that book publishing is inherently difficult to finance because of the length of the pre-publication period, low inventory and receivables turnover, and the uncertain sales of individual books. On the other hand, large book publishers, like major periodicals and newspapers, appears to enjoy satisfactory profits. They are therefore in a relatively good position to obtain financing.

Concentration/Ownership

The degree of concentration varies widely in the publishing industry:

- daily newspapers are a local monopoly in all but the largest cities, and two chains, Thomson and Southam, control some 60% of circulation nationally;
- in periodicals, Maclean Hunter has a third of consumer magazine advertising revenue, as well as a major share of trade magazines;
- book publishing is less concentrated, with 175 firms reporting to Statistics Canada in 1978.** Of these, the 42 largest accounted for 88% of sales.

Barriers to entry are low in the publishing of books, weekly newspapers and magazines because both typesetting and printing can be contracted out. Moreover, the industry has an inherent appeal to a significant group of people, apart from the prospects of commercial success.

Although entry may be easy, commercial success and growth are not. Problems include:

- the cost of newsstand and bookstore shelf space, which leads retailers to favour merchandise whose sales prospects appear relatively certain;
- firm economies of scale in marketing and fulfillment;
- economies of mass production for individual publications in terms of editorial labour, typesetting and production costs; and
- uncertainty in demand for individual books, whose importance is reduced if the firm has a large "portfolio" of books.

* Estimate provided by staff at the Royal Commission on Newspapers.

** Statistics Canada Catalogue 87-601. Unpublished data from a 1977 Statistics Canada survey indicates that 12 firms accounted for 56% of total sales.

One factor which may account for the survival of a substantial number of medium-sized publishers in Canada is their role as exclusive agents for foreign publishers. Sales of titles as an exclusive agent account for 37.3% of the revenues of book publishers in 1978.* There is some question as to whether exclusive agent business actually cross-subsidizes publication of Canadian books. However, it is clear that it does permit greater economies of scale in marketing and fulfillment and less risk than if those firms were engaged solely in publishing. It has sometimes been suggested that the exclusive agency concept is in danger, with foreign publishers seeking to eliminate the middleman. If this were to happen, there could be greater economic pressure for Canadian publishing houses to merge.

Daily newspaper publishing is characterized by much higher barriers to entry, largely because suitable printing facilities are not readily available. Newsprint supply may also pose a problem at least in the short term. Economies of scale, at least partly in editorial costs, and the limited advertising market make it difficult for second or third newspapers to survive except in the largest markets. The only cases of successful entry in recent years are tabloids, which serve a distinct market niche and enjoy relatively low costs.

Apart from concentration within specific segments of publishing, there has been a growth in multimedia companies and conglomerates with publishing interests. Examples include Southam, Torstar, Maclean Hunter, Québecor, Thomson, Power Corporation, Irving and Télé-Direct, a Bell Canada subsidiary.

* Statistics Canada Catalogue 87-601.

Geographical Distribution

The segments of publishing where Canada enjoys a strong position because of their inherently local nature, such as newspapers, libraries and bookstores, also tend to be widely dispersed geographically. On the other hand, book and magazine publishing tend to be highly concentrated in Toronto for the English language and Montréal for French. This would appear to be due to the marketing and labour supply advantages of being in a major cultural centre, and perhaps also access to specialized services such as fashion photographers. On the other hand, there are some cases such as Harrowsmith magazine, where it may be an advantage to locate outside a major centre.

For the publishing industry as a whole, including establishments such as newspapers which are also engaged in printing, Statistics Canada figures for 1978 indicate that 48.6% of employment is in Ontario, 20.7% in Québec, and the remaining 30.7% distributed among the other provinces.

Accessibility to published material is clearly better in urban areas because of the presence of bookstores and more convenient newspaper delivery. However, mail service makes it possible to obtain books, magazines and newspapers virtually anywhere. Local and regional libraries also play a role in improving access.

Government Involvement

Federal government financial support to publishing is substantial, if not always highly visible. Programs, and their estimated annual cost include:

- | | |
|--|-----------------------|
| • Federal sales tax exemption | 200-300 million/year* |
| • Second class mail rates for periodicals | 80-190 million/year* |
| • Book post rates | (to come) |
| • Canadian Book Publishing Development Program | 13 million/year |
| • Canada Council grants | 2 million/year |

* Estimates provided by Arts and Culture Branch.

Grant and loan programs exist at the provincial level, as well, including the Half-Back program in Ontario. Provincial and local governments also pay the operating budgets of elementary and secondary schools and of public libraries, which together accounted for 27.0% of English language publishers' domestic sales in 1978.*

Another important measure has been the non-deductibility for income tax purposes of advertising in periodicals classified as non-Canadian. This appears to have been of very substantial benefit to Canadian periodical publishers.

On the other hand, the publishing industry in Canada does not enjoy tariff protection, and there are no obvious non-tariff barriers.

The objectives of existing government policies appear to be largely social (such as improving accessibility to publications) or cultural (promoting publication of Canadian authors or periodicals with Canadian content) rather than primarily economic.

* Statistics Canada Catalogue 87-601. Comparable figures for French language publishers are not available because of a provincial government requirement that school boards buy through retailers.

9. COMPUTER SERVICES

Description

The total 1978 volume of the computer services component in Canada was 531 million¹⁾ according to Statistics Canada, 60%²⁾ of which was accounted for by service bureaus. Employment in the component is estimated at 14,000.¹⁾ Of course, those figures do not include the huge amount of data processing and systems development that takes place "inhouse", which may be in the order of seven to nine times as large.³⁾

The services offered by the industry can be categorized as:

- . processing services;
- . input preparation;
- . software and systems services (sales, rentals, development and maintenance);
- . education and consulting;
- . sales and rental of EDP equipment;
- . turnkey computer projects.

Firms within the component offer different combinations of services, but can generally be grouped into one of three segments:

- . service bureaus: selling data processing services;
- . software houses: developing, adapting and updating customized software or packages; and
- . system houses: providing specialist hardware and software integration, generally in the form of turnkey projects.

The service bureau industry is made up in turn of three types of firms:

- . equipment manufacturers also involved in selling processing services;
- . firms selling their excess processing capacity; and
- . firms whose main business is the sales of processing capacity.

1) Statistics Canada Catalogue 63-222, Annual.

2) The Canadian Computer industry: an economic and industrial perspective on the canadian computer industry, IT&C, Electrical and Electronic Branch, July 1980.

3) Based on market penetration of Service Bureau - industry sources.

However, the sale of excess processing capacity may not be a viable activity over the long run, as the firms involved in such sales cannot guarantee that they will be in the business for very long, nor they can provide the additional processing which may be required by the customer in the future.

Markets

Industry estimates indicate that the volume of the service bureau industry has been growing at 20% annually in recent years. The software industry also appears to be growing very rapidly, although there are few reliable statistics. Software is generally considered to be the fastest growing component of cost for EDP users. It is estimated that it could represent as much as 85-90%* of total costs by 1985, including in-house development and maintenance.

Service bureaus are mostly competing against in-house systems rather than among themselves, since about 90% of all processing is done in-house. The industry gains a new client when a company can be convinced of the overall economic advantages of the use of a service bureau over an in-house system. Moreover, many service bureaus have found regional or industrial "niche" for themselves where there may be no direct competitors. When competition does exist between service bureaus, price is not the main basis for competition. Key factors appear to be network capability, software availability, reliability, quality and range of service.

The cost of change over from an in-house computer to a service bureau or vice versa is often very high, as is the cost of changing from one service bureau to another. As a result, a service bureau's customers are largely captive, and will normally seek a long term agreement for continued supply of processing services.

* JIPDEC report.

The clients of large national service bureaux are generally large firms, but there is a plethora of small local bureaux serving small firms.

In terms of products, sales of on-line data processing services seems to be accelerating while remote batch is in the mature phase. This phenomenon creates a peak demand period and night-time utilization problems. This gives national firms whose network covers several time zones a relative advantage.

Distributed processing systems with customer-owned mini-computers used for input have decreased the bureaux' sales in the area of data entry/editing. However, there appears to be a growing demand for bureaux to provide host computer services. They may also have a role in selling the equipment to carry out the portion of processing which is distributed.

Several new factors represent opportunities and threats to the computer service component:

- . decreasing cost of hardware;
- . advances in telecommunications technology;
- . trend towards integrated office systems;
- . advent of "intelligent hardware" and "higher-level" languages.

We will be commenting further on the implications of these trends later in the study. One possibility is that service bureaux will move increasingly into software development and data base information services.

Trade

Canada appears to have a satisfactory trade balance in the service bureau industry and in the development of customized systems, but it is estimated that 66%* of software packages used in Canada are imported.

* The Canadian computer industry - op. cit.

The economics of software development are such that, ideally, a software firm should be world-wide. This is attributable to the high original investment in developing a software package and the small marginal cost of selling an additional copy or adapting it to a slightly different use.

Service bureaus exported \$17 million* worth of services in 1978 which may be an understatement. There is a lack of statistics on Canadian use of U.S. service bureaus, but it does not appear to be major.

Since the Canadian service bureau industry is relatively more developed than its American counterpart, it could have the required edge to make substantial gains in the U.S. market. However, considering the cost of telecommunications, tariff and tax differentials, and the marketing advantages of having a local centre, any significant penetration of the U.S. market by a Canadian bureau would probably be advantageously made from a U.S. base. The level of the exchange rate between Canadian and U.S. currency is also an important element in this decision.

Another form of trade which may be very significant is the use of U.S. parent company computers to process the data of Canadian subsidiaries. There is no reliable information on the extent of this practice, but some service bureaus report that they are feeling the effect of increased trans-border data flow. In other words, potential or former customers are now getting their processing done by the American parent.

Operations

Economies of scale of various forms are the main "raison d'être" of service bureaus. With the advent of the mini-computer and other technological advances it may be that those economies are not as important as they used to be, or may even be disappearing in terms of hardware. The future "raison d'être" of service bureaus may stem from economies of scale in the utilization of skilled people rather than hardware.

* The Canadian computer industry, op. cit.

Software development is very labor intensive, while service bureaus have been thought of as much more capital intensive. However, with the decreasing cost of hardware, and the increasing cost of qualified manpower, the service bureau industry is becoming less capital intensive.

Skilled programmers and analysts have been in short supply in the industry for many years and this situation is not likely to improve much in the foreseeable future. Marketing people and network engineers are also in short supply. While the labour situation poses operating problems for the industry, it also has a major effect in increasing demand for its output.

Finances

The profitability of the computer services component is unclear. It appears that the profitability of service bureaus has been lagging behind the growth in-sales. One reason has been the accelerating pace of technological change in hardware, which has caused accelerated write-offs of obsolete equipment.

Concentration/Ownership

Computer services are less concentrated than most other components of the communications/information sector, with 200 firms reporting to Statistics Canada in 1978. At that time, the 35 largest firms controlled 80% of the revenues. Moreover, the component is mostly Canadian-owned and operated. 83% of revenues generated in the component flow to Canadian-owned companies.

Entry into some parts of the component, such as programming of customized systems for smaller businesses, is very easy. However, barriers to establishing a major service bureau or software house include:

- demonstrating to potential clients that you are competent and reliable and that you are likely to be around for many years to come. This is important

because the cost of changing over to a service bureau or software package are substantial, making a long-term commitment desirable;

- securing the required capital (especially for service bureaus);
- recruiting qualified manpower.

The trend towards increased concentration in the service bureau industry through mergers and acquisitions which started during the last decade is likely to continue. The advantages of mergers and acquisitions are:

- economies of scale;
- increased network capability;
- easy way to get scarce, qualified manpower;
- easy way to get new clients;
- reduces overall risk through "portfolio effect" as the number of clients increases;
- increase market base for software development.

Geographical Distribution

Facilities within the computer services component are located largely in Ontario (Toronto being the largest centre) and, to a lesser degree, in Québec. Some facilities are also located in Alberta and in British Columbia.

The cost of telecommunications is a key locational factor, so that changes in the rate structure in telecommunications could have an impact on the location of the industry in the long run. The ability to recruit qualified manpower is also important. Also, being located close to the clients has some psychological importance for the client.

Government Involvement

Government action with regards to the service component include:

- contracting out of data processing services;
- tariffs on equipment;
- regulation of telecommunication.

The last two elements are said to have had a strong adverse impact on Canadian service bureaus' competitiveness abroad, while the extent of contracting out is criticized as inadequate.

10. EQUIPMENT

Description

The equipment component consists of four industries:

- telecommunications equipment: including transmission, switching and terminating equipment;
- electronic data processing (EDP) equipment: including computers, peripherals and terminals;
- office automation equipment: including all the electronic equipment found in the office except telecommunications and electronic data processing equipment;
- electronic consumer goods: including television, radio, record playing and recording equipment.

The relative size of each industry in 1978 is shown below:

	<u>Telecom.</u>	<u>EDP</u>	<u>Office Automation</u>	<u>Consumer Goods 1979</u>
Canadian market	\$2 billion ¹⁾	\$870 million ³⁾	\$300 million(?) ⁵⁾	\$700 million ⁶⁾
Employment	40,000+ ²⁾	9,600 ⁴⁾		2,300 ⁷⁾

- 1) The principal telecommunications carries: Expenditures on telecommunication equipment 1973-1982 - DOC PG AND The supply of communications equipment in Canada - DOC undated.
- 2) The supply of communication equipment in Canada - DOC undated.
- 3) The Canadian computer industry - op. at. p. 10.
- 4) Statistics Canada Catalogue 42-216, Annual.
- 5) Inferring value of shipments of EDP equipment from exports by applying the 55% ratio suggested in "The Canadian Computer industry" - op. cit. P.10", (from Electrical & Electronic industry abstract - op. cit. P.88 - class 771-21). Inferring value of shipments of office automation equipment by difference using the above figure and Statistics Canada catalogue 42-216. Basic assumption (or definition): "Office and Store machinery" consists of EDP equipment and office automation equipment.
- 6) From Statistics Canada catalogue 43-205 and import and export figures.
- 7) From Statistics Canada catalogue 43-205.

Markets

Traditionally, the markets for these four industries were quite different:

- the EDP and office automation equipment industries sold to business and government in general;
- the telecommunications equipment industry sold to the regulated carriers; and
- the consumer goods industry sold to households through retail outlets.

With the CRTC's terminal interconnect decision, telecommunications equipment is now being sold directly to business and household users. Microcomputers have broadened the EDP equipment market to include smaller businesses, and to some extent households. The use of retail outlets is a new feature in those two industries and may increase significantly in the next few years.

Some other key points about the equipment market which have emerged from our research to date are:

- Market growth rates for the telecommunications (13%)* and EDP (12%)** equipment industries appear to be slowing in dollar terms. This may be due in part to prices, which are generally decreasing or increasing at a lesser rate than the cost of living.
- In telecommunications, demand is strongly conditioned by the oligopsonistic situation of the carrier industry and government regulation of that industry.
- The capacity of people to adapt to important changes in their working environment, their working habits and their way of life is a serious potential limitation to the growth of the office automation and electronic consumer goods industries. However, the EDP equipment industry has demonstrated that such resistance can be overcome over time if the advantages of the new technology are sufficiently great.

* Average 1973-1980 - The principal Canadian telecommunication carrier expedition on Telecommunications Equipment - 1973-1982 Table 1.

** From the Canadian computer industry - op. cit.

- . With the exception of consumer goods - where there is strong competition on prices, quality and brand differentiation - competition in the equipment component takes place on such factors as the closeness of fit between the product and customer's needs, supplier's reliability, sales support services and prices.
- . The rate of new product introduction is fast in all but the consumer goods industry where the market could presently be characterized as mature. However, this does not exclude the possibility of important new products being introduced.

Trade

The following table shows estimated imports and exports of equipment in 1979, excluding components. Figures are in millions of dollars.

	<u>Telecom.</u>	<u>EDP</u>	<u>Office Automation</u>	<u>Consumer Goods</u>
Imports	\$200 ¹⁾ (?)	\$850 ³⁾	\$240 ⁵⁾ (?)	\$543 ⁷⁾
Exports	400 ²⁾ (?)	350 ⁴⁾	137 ⁶⁾	105 ⁸⁾

As the table shows, the telecommunications equipment industry is the only one where a positive trade balance exists. Overall, the trade deficit exceeds \$1 billion. Moreover, these gloomy figures do not tell the whole truth - the technological content of our imports is much higher than that of our exports. For example, of the exports of EDP equipment only 2% are CPU, 9% are peripherals, and fully 74% are data communications devices.⁹⁾

- 1) Electrical and electronic industry, abstract of industry and trade Statistics - 1979 annual report - P.62 - classes: 634-19, 634-99.
- 2) Idem P.85 classes 634-19, 634-99.
- 3) The Canadian computer industry, op. cit. P.8.
- 4) Idem P.10.
- 5) Electrical and electronic industry abstract of industry and trade statistics - Table 28 - excluding computers and parts 771-20, 771-22.
- 6) Idem Table 44 - excluding computers and parts 771-21.
- 7) Idem Table 27.
- 8) Idem Table 43.
- 9) The Canadian Computer Industry, op. cit.

Excluding telecommunications, the world market for equipment is dominated by large U.S. and Japanese multinationals. The early U.S. lead is being challenged by aggressive Japanese multinationals whose participation in the world market is stimulated and orchestrated by the Japanese Government. The Japanese have been especially successful in the photocopy and consumer goods industries. The latter success is explained by a late entry and massive investment in technology and automation in a mature industry where U.S. productivity and inventiveness was flagging.

Conversely, in most industrialized countries the telecommunications equipment sector has always been and still is to a large extent protected. This protection on the carrier side gave rise to large national firms in each of those countries. By those standards, Northern Telecom is relatively small.

Operations

The equipment component is generally capital intensive. Operating technology is evolving continuously throughout the component as a result of technological changes in the products, the use of CAD/CAM technology and the trend towards more automation. In particular, the Japanese TV industry's drive towards the fully automated factory will compell competition to follow suit.

Components for equipment are generally imported, mostly from the U.S. and Japan. Their cost has generally been decreasing (especially in the case of the "chip" because of advances in technology and international competition.

Technicians, design and process engineers and marketing people (with some technical expertise) are somewhat scarce, thereby compelling equipment firms to invest considerable time and money in the education, training and retraining of their employees.

R & D is relatively strong in the telecommunications equipment industry. Some EDP R & D is done in Canada by multinationals, but it is partial (i.e.: part of an international research complex) and there is no reason to believe that its results will be converted into manufacturing activity in Canada.

Finances

Profitability appears to be good throughout the equipment component, except in the consumer goods industry where it is low because of competition from Japanese firms.

Small firms trying to move from R & D into commercialization generally meet with serious financing problems. The venture capital which should normally be available at that point to replace government financing seems to be short. This may be due to the abbreviated product life cycle caused the accelerating pace of technological change in the component, and uncertainty as to the direction of government policy (i.e.: interconnect and carrier connection issues).

Concentration/Ownership

The telecommunications and EDP equipment industries are highly concentrated, with the largest single firms controlling roughly 50% of the market. 80% of the market is controlled by the 15 largest firms in telecommunications and by the 10 largest firms in EDP. Statistics are not available on concentration in office automation and consumer goods.

The Canadian presence is strongest in the telecommunications equipment industry, mostly because of Northern Telecom. Canadian presence in the other industries is weak to dismal. For instance, only 6% of the revenues of the EDP equipment industry flow to Canadian-owned firms.

The very similar industrial structure and vastly different ownership situation which can be observed in the telecommunications and EDP equipment industries appear to stem from:

- . the importance of R & D in both industries;
- . the carrier oligopsony and government regulation of telecommunications;
- . economies of scale and international competition in the world-wide EDP equipment industry.

Some horizontal integration is taking place within the equipment component. If the trend towards integrated office systems materializes, the component may go through an active period of integration/rationalization. If such were the case, small specialized manufacturers (generally Canadian owned) may become targets for acquisition by larger firms, including multinationals. Many of those manufacturers may also be looking as mergers as the only way to grow as they are not solid enough financially to maintain the required level of R & D which is pre-requisite for sustained growth.

Barriers to entry in the well-established parts of the industry, such as mainframe computers, are generally high in the form of the capital, know-how and technology required, as well as the reputation and credibility required to gain market acceptance. However, new firms have been able to enter and grow rapidly by specializing in high-technology products or market segments not pursued by the major firms.

Geographical Distribution

Production facilities for equipment are located mostly in Ontario, Toronto and Ottawa being the two main centres. Some facilities are also located in Québec. Locational factors include:

- availability of qualified manpower;
- amount and conditions of Government assistance available;

- proximity to the market (though the transportation component in total cost of delivered products is generally small).

High technology parts of the component tend to grow in regional clusters, as in recent years in Ottawa, because of new firms being set-up by employees leaving established companies, and because of the shortage of qualified manpower.

Government Involvement

Government action in the component, both direct and indirect, includes:

- Government R & D;
- Government subsidies to R & D;
- University research;
- Tariff protection;
- Regulation of telecommunications;
- CDC investments;
- IT & C industry assistance programs (at large);
- loan guarantee to Electrohome;
- IT & C pressure on multinationals to rationalize their operation on a world-wide basis and give world product mandates to their Canadian subsidiaries.

The global impact of these programs is as yet unclear. There has been limited success in getting multinationals to manufacture and to conduct R & D in Canada. There was also a limited success of the protective and inducement measures in giving birth to a Canadian-owned industry. On the other hand, changes in telecommunications, such as the terminal interconnect decision, may have an adverse effect on equipment manufacturing in Canada.

DEPARTMENT OF COMMUNICATIONS

FRAMEWORK STUDY
INFORMATION PRODUCT AND SERVICE FLOWS

Appendix A
Page 1

From	To	Households	Business Generally	Message Transmission	Program Production	Program Distribution	Publishing	Computer Services	Equipment
Households		(.personal letters) (.personal telephone calls) (.classified ads)	(.enquiries) (.orders) (.payment of invoices) (.complaint letters/calls)		(.phone-in participation)	(.community channel participation)	(.letters to editor)		
Business Generally		(.direct mail advertising) (.telephone sales) (.television ads) (.radio ads) (.newspaper ads) (.magazine ads) (.invoices)	(.direct mail advertising) (.telephone sales) (.enquiries) (.orders) (.payment of invoices) (.other business messages) .surplus computer capacity .specialized application software		(.news releases)		(.news releases)		
Message Transmission		.rental/sale of telephones .local telephone service .long distance telephone service .directory listings .directories .local mail .long distance mail	.rental/sales of telephones and PBX's .local telephone service .long distance telephone service .directory listings, incl. yellow pages .directories .data transmission .facsimile transmission .Telex/TWX equipment and service .network interface equipment .mobile telephone service .paging service .mailing lists .local mail .long distance mail .local messenger service .long distance messenger service .telepost	.delivery of telegrams via telephone .delivery of telegrams via mail .telepost delivery .satellite transmission of voice and data .access to local loops - Bell to CNCP .mail delivery of telephone bills		.long distance transmission of programs and news items .mail delivery of cable bills	.transmission of news service copy incl. photos .satellite transmission for remote printing of newspapers .mail delivery of periodicals .periodical subscription correspondence .direct mail sale and delivery of books .telephone sale of newspaper subscriptions .delivery of electronic publishing services	.data transmission	

To	Households	Business Generally	Message Transmission	Program Production	Program Distribution	Publishing	Computer Services	Equipment
From								
Program Production	.pre-recorded videotapes or discs .records .pre-recorded audio tapes	.training and publicity films and videotapes .audio/visual instruction materials for schools		.movie sound tracks for record/tape production .dubbing of audio/visual programs in other languages .versioning of programs for different markets	.audio/visual programs to tv stations and cinemas (.records supplied to broadcasters)	.book rights to audio/visual productions (.interviews with authors)		
Program Distribution	(.tv broadcasts) (.radio broadcasts .cable delivery of tv and fm radio broadcasts .community channel programming .cinema admissions .simple teletext via cable (.program guides)	.tv ad audiences .radio ad audiences	.ads for long distance and other services	.studio rentals by broadcasters to independant producers (.radio air time for records)	(.tv and fm radio broadcasts to cable system) (.tv promotion of coming programs) (.cinema promotion of coming films) .tv and radio ads for films	(.program information) (.cinema admissions for reviewers) .tv ads for newspapers		.tv ads for equipment
Publishing	.books .subscriptions to newspapers and periodicals .single copies of newspapers and periodicals .classified ad audiences (.controlled circulation periodicals) (.library book loans) (.library film loans) (.library access to reference books, newspapers, periodicals, audio recordings) .home study courses .textbooks .bibliographic services .abstracting services	.newspaper ad readership .periodical ad readership .subscriptions .books .loose leaf services .trade directories .news clippings and similar retrievals .current news service .home study instruction of personnel .bibliographic services .mailing list rentals		.audio/visual production rights (.newspaper/periodical reviews and coverage of records)	.program guides (.newspaper/periodical reviews and coverage of films and tv programs) .newspaper ads for films and tv programs	.magazine excerpts of books .library book purchases .wire service copy .copy for news clipping and similar services (.books to newspapers/periodicals for review) .subsidiary rights for translation/adaptation .periodical ads for books (.book reviews in newspapers/periodicals)		.periodical ads for equipment and software

To		Households	Business Generally	Message Transmission	Program Production	Program Distribution	Publishing	Computer Services	Equipment
Computer Services		.microcomputer application packages	.batch and interactive processing time .use of specialized software .access to computer-based information services .systems software .application packages .custom programming .hardware/software packages					.custom software for service bureaus	
Equipment		.telephone sales .telephone answering equipment .typewriters .calculators .microcomputers .radio receivers .television receivers .videotape recorders and players .audio tape recorders and players .GRS and amateur radio equipment	.telephone and PBX sales .telephone answering equipment .mobile radio equipment .mainframes .minicomputers .microcomputers .terminals .printers .systems software .application packages custom programming .automated teller machines .point of sale equipment .typewriters .word processors .facsimile equipment .copiers .microform equipment .cash registers .calculators .dictation equipment .filing cabinets .printing and graphics equipment	.telephones and PBX's .switching and network control equipment .telex/TWX terminals .mobile radio and paging equipment .mail encoding and sorting equipment .satellites .earth stations .microwave transmission equipment	.cameras and other production equipment .computer editing equipment	.broadcasting equipment .cable head end equipment, trunks and drops	.library cataloguing and circulation control equipment .text editing and composing equipment .printing and graphics equipment	.mainframes, terminals, printers and systems software for service bureau operations .minicomputers etc. for OEM's	

From	To	Households	Business Generally	Message Transmission	Program Production	Program Distribution	Publishing	Computer Services	Equipment
Related Services		.invitations and other custom printing	.printing of publicity, training and other material .business forms .printing of catalogues .circulation statistics .audience ratings .advertising creative services .advertising booking	.directory printing			.printing, binding, typesetting, etc.		

Note: Flows shown in brackets are those where the entity receiving the product or service does not pay for it directly, for example television broadcasts.

DEPARTMENT OF COMMUNICATIONS

FRAMEWORK STUDY

CLASSIFICATION OF EXISTING GOVERNMENT PROGRAMS

GOVERNMENT PROGRAMS (BY COMPONENT)	AGENCY	TYPE OF INSTRUMENT	OBJECTIVE		COST(\$mil)	
			ECONOMIC DEVELOPMENT OF SECTOR	OTHER OBJECTIVES	Non-recurring	Annual
		International Agreement	Technology	Cultural		
		Persuasion/Information	Capital	Social Equity		
		Tax Incentives/Disincentives	Human Resources	Economic Sovereignty		
		Subsidies	Production/Procurement	Infrastructure at reasonable cost		
		Government Purchasing	Marketing/Distribution	Orderly Market		
		Government Quasi-Commercial Activity		Stimulating Demand		
		Government Service Free of charge		Capital		
		Patent/Copyright Protection		Human Resources		
		Rate Regulation		Production/Procurement		
		Control over Entry/Use		Marketing/Distribution		
		Legal Requirement/Prohibition		Technology		
		Provincial/Local				
		Other Federal Dept.				
		Federal Crown Corp./Agency				
		CRTC				
		Dept. of Communications				
GENERAL: <ul style="list-style-type: none"> Canada Manpower Training Program -institutional Canada Manpower Training Program -industrial patent legislation copyright legislation 					-	?
					-	?
					-	?
					-	?

	AGENCY	TYPE OF INSTRUMENT	OBJECTIVE		COST(\$mil)	
			ECONOMIC DEVELOPMENT OF SECTOR	OTHER OBJECTIVES	Annual	Non-recurring
			Technology	Cultural		
			International Agreement	Social Equity		
			Persuasion/Information	Economic Sovereignty		
			Tax Incentives/Disincentives	Infrastructure at reasonable cost		
			Subsidies	Orderly Market		
			Government Purchasing	Stimulating Demand		
			Government Quasi-Commercial Activity	Capital		
			Government Service Free of charge	Human Resources		
			Patent/Copyright Protection	Production/Procurement		
			Rate Regulation	Marketing/Distribution		
			Control over Entry/Use			
			Legal Requirement/Prohibition			
			Provincial/Local			
			Other Federal Dept.			
			Federal Crown Corp./Agency			
			CRTC			
			Dept. of Communications			
MESSAGE TRANSMISSION:						
interconnection of Bell and CNCP networks	X				X	
ban on SCC's and VAC's	X				X	
terminal attachment program certification	X				X	
terminal attachment policy	X				X	
telephone co. rate regulation	X				X	
inclusion of non-telephone revenues in rate of return calculations	X				X	
limitations on earth station licensing	X				X	
preference to common carriers in microwave licensing	X				X	
rural service improvement policies	X				X	
Northern Communications Assistance Program	X				X	
management of the radio frequency spectrum	X				X	

FRAMEWORK STUDY

CLASSIFICATION OF EXISTING GOVERNMENT PROGRAMS

	AGENCY	TYPE OF INSTRUMENT	OBJECTIVE		COST(\$mil)	
			ECONOMIC DEVELOPMENT OF SECTOR	OTHER OBJECTIVES	Annual	Non-recurring
GOVERNMENT PROGRAMS (BY COMPONENT)	Dept. of Communications	International Agreement	Technology	Cultural		
		Persuasion/Information	Human Resources	Social Equity		
		Tax Incentives/Disincentives	Production/Procurement	Economic Sovereignty		
		Subsidies	Marketing/Distribution	Infrastructure at reasonable cost		
		Government Purchasing		Orderly Market		
		Government Quasi-Commercial Activity		Stimulating Demand		
		Government Service Free of charge		Capital		
		Patent/Copyright Protection				
		Rate Regulation				
		Control over Entry/Use				
		Legal Requirement/Prohibition				
	Provincial/Local					
	Other Federal Dept.					
	Federal Crown Corp./Agency					
	CRTC					
MESSAGE TRANSMISSION (continued):						
. international participation	X		X		3	-
. postal service					540	-
. Teleglobe						-
. Telesat (government shareholding)	X					-
. ANIK - B pilot projects	X		X			?

FRAMEWORK STUDY

CLASSIFICATION OF EXISTING GOVERNMENT PROGRAMS

	AGENCY	TYPE OF INSTRUMENT	OBJECTIVE		COST (\$mil)		
			ECONOMIC DEVELOPMENT OF SECTOR	OTHER OBJECTIVES	Annual	Non-recurring	
GOVERNMENT PROGRAMS (BY COMPONENT)	Dept. of Communications		Technology				
			Marketing/Distribution				
			Production/Procurement				
			Human Resources				
			Capital				
			Stimulating Demand				
			Infrastructure at reasonable cost				
			Economic Sovereignty				
			Social Equity				
			Cultural				
			International Agreement				
			Persuasion/Information				
			Tax Incentives/Disincentives				
			Subsidies				
			Government Purchasing				
		Government Quasi-Commercial Activity					
		Government Service Free of charge					
		Patent/Copyright Protection					
		Rate Regulation					
		Control over Entry/Use					
		Legal Requirement/Prohibition					
	Provincial/Local						
	Other Federal Dept.						
	Federal Crown Corp./Agency						
	CRTC						
	Dept. of Communications						
PROGRAM PRODUCTION:							
. production of educational TV programming							
. 100% CCA for films or video productions	X						
. Canadian Film Development Corporation							
. CBC program production operations							
. National Film Board operations							
. CBC program production for native people							

[illegible]

DEPARTMENT OF COMMUNICATIONS

FRAMEWORK STUDY

CLASSIFICATION OF EXISTING GOVERNMENT PROGRAMS

[illegible]

FRAMEWORK STUDY

CLASSIFICATION OF EXISTING GOVERNMENT PROGRAMS

	AGENCY	TYPE OF INSTRUMENT	OBJECTIVE		COST(\$mil)	
			ECONOMIC DEVELOPMENT OF SECTOR	OTHER OBJECTIVES	Non-recurring	Annual
GOVERNMENT PROGRAMS (BY COMPONENT)	Dept. of Communications	International Agreement	Technology	Cultural	-	4
	CRTC	Persuasion/Information	Marketing/Distribution	Social Equity	-	13
	Federal Crown Corp./Agency	Tax Incentives/Disincentives	Production/Procurement	Economic Sovereignty	-	?
	Other Federal Dept.	Subsidies	Human Resources	Infrastructure at reasonable cost	-	?
	Provincial/Local	Government Purchasing	Capital	Orderly Market	-	80
	Legal Requirement/Prohibition	Government Quasi-Commercial Activity	Stimulating Demand		-	200
	Control over Entry/Use	Government Service Free of charge			-	350
	Patent/Copyright Protection	Government Service Free of charge				
	Rate Regulation	Government Service Free of charge				
	Government Quasi-Commercial Activity	Government Service Free of charge				
	Government Service Free of charge	Government Service Free of charge				
	Government Service Free of charge	Government Service Free of charge				
	Government Service Free of charge	Government Service Free of charge				
PUBLISHING: . Canada Council grants to book publishers . Canadian Book Publishing Development Program . loans or loan guarantees to publishers . grants for books of cultural value . second class postage for periodicals . federal sales tax exemption for publishing . operation of libraries	X		X	X		

FRAMEWORK STUDY

CLASSIFICATION OF EXISTING GOVERNMENT PROGRAMS

	AGENCY	TYPE OF INSTRUMENT	OBJECTIVE					COST(\$mil)	
			ECONOMIC DEVELOPMENT OF SECTOR	OTHER OBJECTIVES				Annual	Non-recurring
				Cultural	Social Equity	Economic Sovereignty	Infrastructure at reasonable cost		
			Capital						
			Human Resources						
			Production/Procurement						
			Marketing/Distribution						
			Technology						
			International Agreement						
			Persuasion/Information						
			Tax Incentives/Disincentives						
			Subsidies						
			Government Purchasing						
			Government Quasi-Commercial Activity						
			Government Service Free of charge						
			Patent/Copyright Protection						
			Rate Regulation						
			Control over Entry/Use						
			Legal Requirement/Prohibition						
			Provincial/Local						
			Other Federal Dept.						
			Federal Crown Corp./Agency						
			CRTC						
			Dept. of Communications						
GOVERNMENT PROGRAMS (BY COMPONENT)									
COMPUTER SERVICES:									
. contracting out of data processing									

FRAMEWORK STUDY

CLASSIFICATION OF EXISTING GOVERNMENT PROGRAMS

	AGENCY	TYPE OF INSTRUMENT	OBJECTIVE										COST(\$mil)				
			ECONOMIC DEVELOPMENT OF SECTOR					OTHER OBJECTIVES					Annual	Non-Recurring			
			Technology	Marketing/Distribution	Production/Procurement	Human Resources	Capital	Stimulating Demand	Orderly Market	Infrastructure at reasonable cost	Economic Sovereignty	Social Equity			Cultural		
GOVERNMENT PROGRAMS (BY COMPONENT)	Dept. of Communications																
	CRTC																
	Federal Crown Corp./Agency																
	Other Federal Dept.																
	Provincial/Local																
	Legal Requirement/Prohibition																
	Control over Entry/Use																
	Rate Regulation																
	Patent/Copyright Protection																
	Government Service Free of charge																
	Government Quasi-Commercial Activity																
	Government Purchasing																
	Subsidies																
	Tax Incentives/Disincentives																
Persuasion/Information																	
International Agreement																	

DEFINITIONS FOR
CLASSIFICATION OF EXISTING GOVERNMENT PROGRAMS

Type of Instrument

Legal Requirement/Prohibition - a requirement established by law or regulation and applying to all of those engaged in a particular activity.

Control over Entry/Use - licensing and conditions enforced through the licensing process, generally involving the exercise of some discretion by regulatory body.

Rate Regulation - control by a regulatory body over rates and related terms and conditions of service, regardless of whether an explicit rate of return criterion is applied.

Patent/Copyright Protection - protection of the rights of inventors, authors, etc. by statute.

Government Service Free of Charge - services where cost is paid entirely or almost entirely out of general tax revenues.

Government Quasi-Commercial Activity - services provided by a government department, agency or crown corporation where the prices charged to users are expected to cover a significant portion of the cost, or even to result in a profit. Also includes debt or equity financing by government where a cash return is expected.

Government Purchasing - contracting out or purchasing policies whose intent is at least partly to influence the development of the private sector.

Subsidies - cash payments by the government, whether one-time or recurring, intended to make an activity more attractive or viable for producers or consumers.

Tax Incentives/Disincentives - measures to reduce (increase) the income or other taxes otherwise payable by producers or consumers in order to encourage (discourage) them to undertake a particular activity.

Persuasion/Information - efforts by the government to encourage actions in the public interest but without the use of legal sanctions or monetary incentives.

International Agreement - agreements binding on Canada and other nations to facilitate or regulate trade and information exchange and to ensure co-ordination of activities.

Objective

Economic Development of Sector - programs one of whose principal stated objectives or intended effects is to foster commercial operations in the communications/information sector, generally under private ownership, which will ultimately be self-sustaining financially.

Other Objectives - programs related to the communications/information sector but one of whose principal stated objectives or intended effects falls outside the definition for economic development of the sector.

Technology - programs to assist the economic development of the sector through the development of new technology with respect to products, uses, components, inputs, production processes or distribution methods.

Marketing/Distribution - programs to assist the economic development of the sector through the implementation of improved marketing and distribution practices or facilities, including those for export purposes.

Production/Procurement - programs to assist the economic development of the sector through the implementation of improved production or procurement practices or facilities, including assistance to suppliers of components or raw materials.

Human Resources - programs to assist the economic development of the sector by increasing the supply of personnel with relevant qualifications or by assisting the sector in obtaining such personnel.

Capital - programs to assist the economic development of the sector by increasing the amount of equity or debt financing available. Programs which focus on increasing revenues would not be included, nor would financial assistance directed toward specific objectives such as technology development.

Stimulating Demand - programs to assist the economic development of the sector by encouraging the purchase of its output. Programs to encourage multinationals to locate a greater proportion of their production in Canada would also be included. When the stimulus is to demand for the products of another component, an abbreviation is used to indicate the component affected, for example PP for program production or EQ for equipment.

Orderly Market - programs to maintain order in the marketplace, normally for the benefit of all participants rather than to favor some specifically.

Infrastructure at Reasonable Cost - programs to ensure that communications/information services needed by businesses and households generally are available to them and that the cost is reasonable. Such programs contribute to economic development generally, but the development of the communications/information sector is a means rather than an objective.

Economic Sovereignty - programs to ensure that Canada has some degree of self-sufficiency in aspects of the communications/information sector considered vital to the economy as a whole. Distinguished from programs directed to the economic development of the sector because support for the activities is not based on the expectation that they will become financially self-sustaining.

Social Equity - programs related to considerations such as individual privacy, accessibility of information about government, non-discrimination and assistance to the disadvantaged including people living in isolated areas.

Cultural - programs related to considerations such as development and protection of Canadian culture, the availability of cultural products with Canadian subject matter, and the enlightenment or cultural enrichment of the public generally.

Cost

When available, cost figures refer to estimated expenditures for the 1981-82 fiscal year, or for non-recurring programs to the latest total estimated cost.

TOWARD A POLICY FRAMEWORK FOR THE
ECONOMIC DEVELOPMENT OF THE
COMMUNICATIONS/INFORMATION SECTOR

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