CANADIAN DATABASE PROMOTION INITIATIVE FEASIBILITY STUDY

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A. EXECUTIVE SUMMARY

Information is a strategic resource and the ability for Canada to compete in a global marketplace increasingly depends upon the ability of Canadian industries to satisfy their information needs in the most timely and efficient manner.

The creation and sale of information and knowledge based services is an important industry in its own right. In an information economy, a strong database industry can bring specific and broad based economic gains to Canada.

The strengths and weaknesses of the database industry in Canada were highlighted in previous studies commissioned by the Department of Communications and have provided the basis for development of strategies for stimulation of the electronic information market in Canada. This research confirmed that market growth can most effectively be attained by creating awareness within the marketplace, focusing on new markets (non-users), and stimulating strategic alliances.

Other countries have established market infastructure support programs. The Japanese Database Promotion Centre, established in 1984, has a current funding allocation of US $14.5 million over a five year period and the European Economic Community renewed its IMPACT 2 program in 1990 anticipating a domestic information services industry growth rate of between 20 and 30 percent over the next decade.

In 1990, the Department of Communications commissioned this study to determine the feasibility of a Canadian Database Promotion Initiative (CDPI). The study is co-sponsored by Bell Canada, The Alberta Ministry of Technology, Research and Telecommunications and the Canadian Association of Data, Professional Services, and Software Organizations (CADAPSO).

At the outset of the project, consultations were held with information industry representatives to develop a preliminary Concept Plan. It was subsequently used as a background paper for consultations with provincial governments, telecommunication carriers and business and industry representatives across the country to obtain input for programming, organizational, and funding issues. This was then followed by a cost effective analysis by the consultants.

Consultations showed unanimous agreement on the following subjects:

- that the major barriers to the use of electronic information services include attitude and awareness problems as well as price considerations relative to perceived value and quality of information

- that commitment is essential to some form of program to overcome these barriers to strengthen the industry and increase Canada's competitive position

- that a program such as the CDPI approach would be of greatest value if it were a joint undertaking of information industry, users, carriers and government

- that financial contributions of the information industry should increase each year (no matter how small it may be initially). This is essential to ensure their commitment to the program.

- that government support of the database industry should be strong because it would position Canada to better seize all the opportunities inherent in the transformation to an information economy

Alternatives to the CDPI strategy were briefly reviewed but were deemed to have a producer focus rather than a user orientation. They include grants and subsidies, government financing of the industry and adoption of an explicit policy of government purchases of Canadian database products. Grants and subsidies create an artificial market rather than stimulate the market. Although opinion was strong that government purchasing of Canadian products should be increased, such a program would not satisfy the needs of the market, or secure the long term success of the database industry.

The conclusion reached through consultations and a cost-effective analysis is that the development of a Canadian Database Promotion Initiative is the most appropriate, feasible and effective course of action at this time.

The Canadian Database Promotion Initiative should be:

- a market stimulation program intended to strengthen the Canadian industry through activities such as:

- Market (Supply and Demand) Analysis
- Awareness and Promotion Programs
- Training and Education Programs
- Clearinghouse
- Networking
- Research and Development
- Standards

o a catalyst for equitable distribution of activities and programs to communities across Canada with provincial offices and a series of partners coordinated by a small national office and linked by an electronic network

o a facilitator of synergy amongst all players within, and peripheral to, the information industry for the most effective and efficient delivery to the market

o a non-profit corporation which will evolve over time

o a vehicle for the database industry to collaborate with other national strategies relating to the communication and dissemination of information such as VISION 2000, ISnet, the National Business Information Network and the Canadian associations that exist to foster information technology

The budget of the initiative is estimated at approximately $1M in the first year and $2M in each succeeding 4 years. Continual monitoring of the success of the initiative is imperative to ensure appropriate use of funds. It is recommended that government funding total 70% in the first year but total industry funding should increase incrementally and, by year 5, the government/industry balance be 30/70.

Canadian businesses must be prepared to compete in the new world economy. Information skills and awareness are necessary parts of such preparation. An increase in such skills and the appreciation of the value and role of information cannot help but have a salutary effect on the population at large, attributes that will be increasingly called for in all walks of life.

B. BACKGROUND

1. Introduction

The Canadian Database Promotion Initiative (CDPI) is an initiative proposed by the Department of Communications as a means of providing a focal point for industry and government to develop programs and activities to increase awareness and stimulate the growth and development of the electronic database industry in Canada.

The rationale for CDPI stems, first, from a view that Canada is lagging behind several other industrialized countries in the development of an electronic database industry. Businesses in all sectors operate in a market environment which is becoming increasingly globalized and subject to ever-increasing competitive pressures. The strategic importance of information is becoming recognized and the role of electronic databases services vis-a-vis the rest of the economy is being realized.

Secondly, the CDPI rationale stems from the view that to promote the information industry in Canada will be beneficial to both our information industry and the Canadian industrial community in general.

The competitive position of Canadian industry dropped from its position of 4th in 1989 to 5th in the World Competitiveness Report in 1990. Canada's weakest rankings were in the categories of international orientation and futures orientation. The latter is a measure of the preparations countries are making in anticipation of an increasingly technology-based economy.

As the world economy increasingly defines prosperity by the creation and sale of information and knowledge-based services, there is potential economic benefit for a more vibrant database industry in Canada.

2. Industry Definition

For purposes of this report, the Canadian Electronic Database Industry is defined as:

> **Producers or suppliers of commercial information services, located in Canada, accessible in electronic form.**

There are several variables relevant to this definition, and each have been considered carefully against the rationale of the CDPI. These are:

- domestic versus foreign ownership
- domestic versus foreign content
- producers versus suppliers
- public (or government) versus private sector
- commercial versus non-commercial

Included in this definition are, not only producers of databases located in Canada, but also suppliers of database services or vendors who may market either Canadian databases (which may include either Canadian or non-Canadian content) or foreign databases.

Within this definition, the industry can be categorized by four distinct categories of delivery medium:

- online database services
- CD-ROM services
- floppy disc services
- tape distribution services

Although, for sake of brevity, much of the discussion that follows identifies online services, producers and suppliers of information services in all electronic media are assumed part of the information industry definition.

3. Consultations

Partners in the study (Alberta Technology, Research and Telecommunications, Bell Canada, the Canadian Association of Data, Professional Services and Software Organizations and the Department of Communications) formed a Steering Committee representing a cross section of the major players which would have a stake in a Canadian Database Promotion Initiative.

An evolving process, the study began with preliminary consultation with information industry representatives and selected industry associations. These consultations were held to determine information industry interest in the concept and to involve the industry in the development of scenarios for coordination, management and funding of the initiative and determine their priorities for activities and programs.

With the general feeling of the industry in hand and the assistance of the Steering Committee, IGW developed a discussion paper, the Canadian Database Promotion Initiative Concept Plan. This plan was distributed to selected Provincial Government departments, telecommunication carriers, and industry representatives across Canada.

Each potential interviewee was contacted to provide background to the study and present some options for the structure, management and activities of a potential initiative. Recipients were requested to review the document and use it as point of departure for the consultations.

Consultations were planned deliberately to be informal. The format followed a standard interview guide (Appendix 2), however general questions encouraged open discussion on the broad issues surrounding the CDPI as they related to regional needs. This served well to elicit the interviewee's perspectives on the need for such an initiative, its potential to assist industry (both the users of information and information producers) and prompted their candid comments on the most effective mechanism and structure to make it viable within their jurisdiction.

The consultations took place from coast to coast between April and August 1990. Symptomatic of the size of this country, it was with regret that the consultants were not able to meet everyone on a one-to-one basis, however many respondents were kind enough to participate in long discussions by telephone.

A major portion of the consultations took place within a one month period, beginning in Newfoundland and moving across the country to British Columbia. In order to maintain continuity, one consultant was involved in all of the consultations across the country. The study team gained a keen insight into the diversity of the regions and their understanding of the need for solid regional representation was intensified. It also provided an opportunity to experience, first hand, the power of even one individual (a "champion") to disseminate information and act as a human networking vehicle.

C. OVERVIEW OF THE CURRENT ENVIRONMENT

The development of the Canadian database industry is said to be lagging behind, both in absolute and relative terms, that of many other industrialized countries. At the same time, the database industry is perceived as important to Canada's economy, for at least two reasons:

- the potential importance of the sector in and of itself as a source of new income and jobs, i.e., as a growth sector in the Canadian economy

- the importance of this sector relative to the strategic information needs of Canadian businesses in all sectors

It is these latter two arguments coupled with the claim of slow or under-development of the industry in Canada which create the rationale for undertaking the Canadian Database Promotion Initiative (CDPI). It is important, therefore, in assessing the feasibility of CDPI, that these arguments be investigated.

1. The Strategic Role of Information

Information has become a strategic resource for the modern corporation to a degree that has never been realized before. This is a function of a number of factors:

Information Overload
The production of information continues to increase and, therefore, the amount of information available for decision making is greater than ever before.

Computer Technology
Computer technology and continuing advances in this area which have increased our capacity to process information and to retrieve it virtually exponentially relative to the pre-computer era.

Telecommunications Technology

Similarly advances in telecommunications technologies have had the effect of eroding the influence of both time and space on the location of economic activities, particularly those which are information intensive. this has thus expanded the feasible market area of almost all business activity.

Globalization of Markets

Within the last two decades there has been a dramatic increase in both economic interdependence and the level of globalization of economic markets. Attributable to a combination of technological, economic and political factors, this trend has resulted in significant growth in the level of effective competition facing most business firms operating in the global marketplace. Moreover, as trade barriers have been reduced through both multilateral (e.g., GATT) and bilateral (e.g., the Canada-U.S. Free Trade Agreement) agreements, the same competitive pressures will be an impact upon domestic firms with the threat of foreign competition.

The larger the market area served, the more one has to know to be competitive in that market. The more competitive the market, the more one has to know to meet the competition. Global competition is, in part, a function of computer and communications technologies. Ironically, as globalization proceeds, the need for information grows and the ability to respond to, or satisfy those needs, is made possible through the same technologies.

Service Economy

The rising importance and rapid growth of services versus goods production in most industrialized countries, including Canada, has a significant impact upon the information industry. Increasingly becoming an internationally traded commodity; services, not just goods production, are therefore part of the globalization trend. The traditional non-traded status of many services is being eroded and with this change, so too is the traditional "natural monopoly" position previously enjoyed by many service industries.

Commoditization of Information

Another important trend which is particularly relevant to the question of the growth of a commercial database sector, is the commoditization of information. As information has grown in importance in all walks of economic life, it has become increasingly viewed as a product to be bought and sold. The sale of information is itself not new but the scope and format of information now subject to sale is greater than ever before and promises to continue to grow in importance in the future.

This commoditization trend lies at the very foundation of the so-called information economy, an economy where the production, processing, storage, and distribution of information is the major source of new income growth and wealth generation. As information is increasingly privately held, some believe that access to information could become more limited with consequent negative implications for those who are denied access. Thus, there is a potential conflict between the opinion that information must enjoy the widest, most equitable distribution and the profit orientation of the information industry.

However, in most cases the raw information is still available at no charge directly from the source or through a public institution. The information industry then adds value to that information. The information may be organized in a format particularly useful for the market, the user may be provided with a manipulation capability, the speed of availability may be increased, the search capability may be enhanced, the presentation may be customized, etc. These value-added components save the user real resources or otherwise enhance the value of the information itself.

A further consideration is that there must be an incentive for information to be produced and supplied. Zero pricing could actually produce the somewhat perverse effect of reducing the production and/or distribution of information, at least of the type and in the form needed by the business end-user. Therefore, the profit orientation of the industry should not be interpreted as conflicting with the goal of maximizing the economic use of information.

2. The Role of Electronic Databases

Information which is organized and disseminated in electronic form offers a number of advantages to the marketplace. These include the following:

- timeliness
- mobility
- search capability
- manipulative capability
- speed
- currency

These advantages depend upon the availability of the required information through an electronic database service and accessibility to the database. In other words, the content must be appropriate to need and the telecommunications network must reach the necessary locations.

From the demand side, the user must have the need for the special characteristics of database services, a knowledge of the availability of the service and, finally, the ability to use the service.

Appropriate Technologies

Market need, is especially important. It is important to emphasize that electronic database services are not always the best means of satisfying a given need for information. Other sources of information will continue to be used and indeed, these other sources have their own characteristics which make them more appropriate for certain needs. For example, not all information requires the speediest delivery to be of use, nor is it always necessary to have the most current information.

However, the characteristics of electronic database services are likely to be particularly important in a highly competitive and spatially dispersed market situation, where timeliness and mobility will be of greatest value.

In many cases there will be more than one source or medium for the acquisition of information equally capable of satisfying the user's information needs. In such cases, the choice of medium will, to a large extent, be a function of relative cost.

3. The Global Marketplace

The size of the world database industry, as measured by revenues, is estimated by one source to have been $4.2 billion (US) in 1989. The same source estimates that by 1994, world revenues for database vendors will be $11.7 billion (US)[1].

According to these estimates, the dominant share of the world market is held by the United States, which enjoys an approximately 60% market share on a global basis. Western Europe has approximately a one-third share while Japan accounts for much of the balance.

A different source, however, puts the United States behind the U.K. in total database revenues, which were estimated at $3.3 billion (CAN) in the U.S. in 1988 and $4.9 billion (CAN) in the U.K.[2] If these estimates are accepted, then the total market must clearly be larger than the first set of estimates noted above, since this latter estimate of U.K. revenues is by itself almost as large as the total world market estimate from our first source, following exchange rate adjustments.

Link Resources[3] estimates total electronic information revenues for North America in 1988 at $6.651 billion (US) and forecast 1994 revenues of $19.784 billion (US). Of this, online interactive services accounted for 80.1% of the 1988 total and 71.5% of the total by 1993. CD-ROM was only 1.9% of the 1988 total but is projected to rise to 13.1% by 1993. Online broadcast and interactive voice (audiotex) also register some gains over this period, while magnetic tape and floppy disk both show losses. It is the relative shift of CD-ROM versus online interactive services which represents the two most significant changes, however. Although shares of the different media represent differences in relative growth rates, the online interactive services category is still projected to almost triple in value over the 1988-1994 period.

Quite clearly, there are significant differences in these various estimates of market size, not only in the forward projections of future market growth but also in the retrospective estimation of current market size. Despite the fact that the Link estimates do not identify database services separately, there is clearly need for some caution in any attempt to treat these numbers as definitive. Reliable information on this sector is not readily available due to the way in which most countries collect business data and the fact that, as one consultant in this field has observed, "For an industry concerned with the provision of facts and figures,

the business information industry somewhat surprisingly offers few facts and figures on itself." The Global Alliance of Information Industry Associations (GAIIA), of which CADAPSO is a member, is moving towards the standardized collection and dissemination of industry statistics.

Despite these cautions, what these numbers very clearly demonstrate is that the global market is significant.

4. The Canadian Marketplace

Statistics Canada estimates were not available for later than 1987. However, at that time, database services sold by the computer services industry were approximately $25 million.[4] This figure is based on a classification of firms by principal activity rather than by activities themselves; therefore, it is highly probable that the figure is an under-estimate of the Canadian producer market.

A recent report to the Department of Communications by Robertson-Nickerson[5], (see Appendix 3) a companion study to this one quotes figures showing that Canadian online revenues in 1986 were $48 million, compared to the U.S. at $3.7 billion and Europe at $1.3 billion. According to these estimates, Canada's share of the market was 1%. These same estimates projected forward to 1991, show the Canadian share slipping to 0.7% of the market, with revenues of $82 million out of a total of $12.082 billion amongst the three countries/regions.

The preceding estimates of the Canadian market, as noted, represent the production side of the market, i.e., revenues earned by Canadian producers, versus expenditures on database services by Canadian users. Robertson-Nickerson argues that U.S. vendors traditionally have taken up approximately 30% of Canadian revenues. This would represent a share of the preceding producer figures which are, in fact, being earned by Canadian subsidiaries of U.S. parent companies and/or Canadian suppliers remarketing U.S. output.

Robertson-Nickerson also quote an Evans Research[6] report which argues that heavy online users in Canada spend 36% of their online expenditures on non-Canadian content, while low online users in Canada spend up to 65% on non-Canadian content. They argue further that "most non-Canadian information requirements are largely being met by foreign firms."

As calculated by Robertson-Nickerson, Canada enjoys a 7% share of the world's total production of databases, as compared to its 1986 revenue share of 1%. Thus, it can be inferred that Canadian producers are, on average, smaller and/or less profitable than their foreign counterparts.

The top five Canadian information industry firms, (listed as CADAPSO members in 1989) by revenue, are InfoGlobe, Micromedia Limited, Southam Business Information and Communications Group, Utlas International Canada, and FP Online. Two of these companies have a median revenue of $6.25 million, two have a median revenue of $2.75 million, and one has a median revenue of $0.75 million. For comparison purposes, Dow-Jones Information Services had 1989 operating revenues of $214.1 million (US), while Knight-Ridder's Business Information Services division reported 1989 revenues of $275 million (US). Canadian producers are indeed small compared to the largest of their foreign competitors.

5. Conclusions

The discussion of this chapter has made four primary arguments:

- information is a strategic resource for the modern corporation. The ability of Canadian business to compete in an increasingly competitive and global marketplace may well depend on the ability of Canadian businesses to satisfy their information needs in the most timely way possible, irrespective of the location of either the information or the business user

- the database industry itself represents a large and rapidly growing market, one in which Canada presently enjoys a relatively small share based on total revenues/sales

- while accurate estimates of database expenditures by Canadian users are not available, available information indicates that these expenditures are not likely much more than 30% higher than Canadian producer revenues. If so, then Canadian usage of database services, regardless of

source, is also lagging behind other countries.

- taken together, the preceding three arguments mean that Canada is failing to realize fully the two principal economic benefits of a strong database industry, the impact of the industry itself as a dominant growth sector in the economy and the impact of the industry vis-a-vis the economic prosperity of the economy at large owing to the role of information as a strategic resource

Given these conclusions, the question which immediately arises is why this is so, i.e., why is the database industry in Canada lagging that of other countries? We turn to a consideration of this question in the next section of this report by discussing the barriers to growth and use.

D. BARRIERS TO GROWTH AND USE

The preceding section has concluded that an electronic database industry is important to the future growth and prosperity of the economy as a whole. Statistics conclude that the Canadian database industry is currently lagging in its development relative to the industry in other countries, notably the U.S., Europe and Japan and that the Canadian research and industrial community is not taking full advantage of the information resources which exist either in Canada or internationally.

To understand the capability of the information industry to increase its share of international revenues and for the market to increase its competitiveness through greater use of the products of the information industry, we must examine the current barriers to growth.

By identifying and examining barriers, suggestions for counteractive measures can be made. This examination builds on a variety of sources, but emphasizes the comments from a series of interviews, carried out as part of this study, with representatives of the database industry, government and business users of database services in Canada.

Two general categories or types of barriers to the growth of the database industry can be identified. Demand side barriers, which represent barriers to the growth of the industry which relate to the users or potential users of database services, and supply side barriers which represent those which originate from the producers or suppliers of database services. Each of these will be examined in turn.

1. Demand Factors

The demand side of the database market is made up of three classes of users or customers: business users, governments and consumer or residential users. However, as noted earlier, this study is intentionally concentrating on the first two groups.

The following factors are not listed in any order of priority.

Attitudinal Factors

There is a strong cultural bias towards print media that is to be found amongst the potential business user population. This bias may be reinforced by a failure to acquire the necessary skills to operate a computer or a lack of knowledge regarding computers in general.

These attitudes are especially prevalent amongst managers who are responsible for budgetary decisions because, for the most part, they are in an age group whose formal education preceded personal computer technology. However the demographics are changing as we near the 21st Century.

Although partially an awareness problem, the failure of business people to appreciate the strategic importance of information is also attitudinal. A large number of business people perceive their business only in terms of tangibles, whether on the output or input side of their business. This is reinforced by a perception that information is not something which one should have to pay for, at least not large amounts. The availability of large quantities of free information, particularly from government, serve to augment this view.

Awareness

A lack of knowledge of the availability and of the value of electronic databases was viewed by those consulted, as one of the single most important factors, on the demand side of the market, which inhibits the growth of the database industry.

Parallel to this lack of awareness of databases is a lack of awareness of the strategic importance of information irrespective of medium.

It should not be assumed, however, that this awareness problem is limited to those who still do not recognize the value of information. Indeed, as noted by Robertson-Nickerson, even those information specialists already using online services, have a tendency to use a limited number of suppliers and databases in

part because they are unaware of the availability of other suppliers or services.

Size

In terms of potential buyers, the Canadian marketplace is a relatively small one. Most Canadian database suppliers are dedicated to the domestic market. Even assuming maximum market penetration, this presents a concern for sufficient sales to maintain the product. Given the reality of less than maximum penetration rate, this concern is magnified.

However the market is not homogeneous. Different users have very different needs and it is possible for an individual producer to identify a particular market niche which is not large and proceed to fill it adequately. Such cases exist already. But, in terms of a strategy for overall development of the industry, critical mass is still likely to be important in the aggregate.

Cost

As stated above, attitudes to paying for information may inhibit sales. However, independent of this, the cost itself may be prohibitive for many users. Assuming that prices are set fairly, in proportion to producer costs, there is little that any individual vendor or buyer can do to alleviate this problem. It is inherent in the nature of markets.

However, it is likely that, due to front-end costs for creating and maintaining the database itself, as well as the significant up-front investment in equipment, there are significant economies of scale to be realized. An increase in the number of users of the service should enable a reduction in unit price while still realizing a profit. In other words, a lower price is required to expand the number of users while, at the same time, more customers are required in order to reduce the price.

There are at least three ways in which this problem might be tackled. First, market penetration is well below the maximum; therefore, efforts can be made to increase the penetration rate. However, where cost is a significant barrier to increased penetration, this will be of limited success without lowering prices

at the same time. Second, efforts can be made to try to develop export market opportunities as an alternative source of the critical mass necessary to solve the cost problem. Third, government can use its purchasing power to help provide the critical mass which will allow economies of scale to be realized and hence, prices to fall.

Organization of Information Flows

In many companies, the ultimate end-user is not the one who directly uses database services. Rather, many companies have organized dedicated information units which have the responsibility for handling the information needs of the end-users in the company, where the latter are indifferent, in many cases, as to where and how the information is obtained.

This type of information supply organization has some definite advantages, including the fact that librarians and information specialists can be expected to have the skills and knowledge necessary to make effective use of database services. At the same time, however, the lack of direct involvement by end-users can also have the effect of limiting the use of information and reinforcing existing biases towards print media, etc.

This is not an argument against the retention of information specialists either as direct employees of the firm or through contracting the services of an independent information professional. It is, however, an argument for using such resources to complement end-user involvement rather than to replace it.

Technological Capability

Canada continues to lag many other countries in the diffusion of computer technology. Although micro-computers have done much to close the gap that previously existed with respect to mainframe and mini-computers, the gap nonetheless continues to exist. One estimate, not specific to business penetration levels, has put the number of micro-computers per capita in Canada at half the level of the United States.

Perhaps most appropriate to this study, the penetration of a computer-based communications capability (modems, networking) is even lower. At least for the on-line segment of the database market, this is obviously an important factor.

In the service industries, 89% of establishments surveyed by Statistics Canada, are currently using personal computers while only 22% access external databases. Of the remaining 78% only 8% plan to begin using external databases within the next 3 years. This compared to 89% usage of facsimile technology and 3% planning to begin using it within 3 years.

The real importance of both the computer and the communications capability penetration arguments must be seen, however, as symptomatic of many of the problems already referred to above, such as awareness of the value of information, awareness of the value of databases, attitudinal factors, etc. In other words, overcoming the problem of the lack of a device such as a modem is, in itself, a trivial one. What is not trivial are the reasons why there is no modem in the first place.

Uncertainty

There are a number of uncertainties in the market all of which may contribute to a lessening of demand.

Technological Change

There is uncertainty arising from the rapid pace of technological change; potential adopters fear being saddled with an obsolete system because something better is bound to emerge as soon as they have made an acquisition. They also, in many cases, may not be able to judge the relative merits of alternative technologies already available, e.g., on-line systems versus CD-ROM.

Impact of Information

The determination of the real impact of information or the differential impact due to electronic database services raises uncertainties. Information is an intangible in terms of the production process. While

it may be easy to agree, in general, on the value and importance of information, it may be difficult to actually quantify this impact in a particular situation.

Quality

A third possible source of uncertainty has to do with the assurance of the quality of information, especially in electronic form. The problem of reliability is always present and can often only be dealt with by "proving" oneself over time. The reputation and track-record of the vendor or information source is a major factor in providing assurance of quality.

Comprehensiveness

Finally, not only is the quality of information suspect, but also the comprehensiveness. Even though the information in libraries is limited to selection and budget capabilities of the institution, an individual often feels more comfortable searching the shelves of a library and physically viewing the information available rather than searching a remote database by computer.

Determining Information Needs

From a demand perspective, one of the most crucial ingredients for vendor success in the marketplace lies in the ability to meet the needs of the user or purchaser. This means that both the content and the presentation must be appropriate. It also means that the access and protocols must be user-friendly or, at least, somehow motivate the user to learn. The database industry abounds with examples of technically excellent products for which there is simply no demand.

2. Supply Factors

On the supply side the database industry is made up of database producers (those who create the databases) and database suppliers or vendors (those who sell or distribute them).

On the supply side of the market, the crucial role which is played by telecommunications carriers in the delivery of on-line services and networking of all kinds must be recognized. This is of consequence to attitudes regarding the use of computer communications technology and awareness of the value of electronic computer-based communications, both of which are relevant to those identified on the demand side of the market. Of note, also, are the roles of other segments of the information sector, including publishers (as the initial producers of the information), and the hardware and the software industries. All may serve complementary roles with regards to the database industry.

Barriers to the development of the Canadian database industry which may be identified on the supply side of the market are as follows.

Technology versus Demand Driven

A key problem of the database industry is that it has, to some degree, been driven by the technology rather than by market needs. The content, design, packaging, etc. of database services have not paid sufficient attention to the needs of potential users.

Lack of Marketing Effort

Related to the relative inattention to user needs, it has also been true that many Canadian database firms have done little marketing. This may reflect an attitude that a technically sound product will sell itself, a view which is simply not true if the product is not seen as meeting a particular need. In part, however, the relative lack of marketing effort has been a function of a lack of understanding of the marketing requirements involved.

Many of the entrepreneurs of the database industry are not business professionals. They understand the technical requirements for the product but do not necessarily understand the business requirements. Finally, many database firms are small and have very limited resources. Often, by the time they have invested in the development of their product, there may be nothing left to invest in its marketing.

Under-capitalization

Many database firms are under-capitalized relative to their requirements, particularly the requirements for bringing products to market.

The Canadian investment community is inexperienced with this relatively new industry and perceives it, like the software industry, as very high risk. It is a labour intensive industry with a low tangible asset base (often the database itself is the principal asset) and the potential investors cannot foresee a high enough return on investment within an appropriate time to make the risk worthwhile.

Lack of Research and Development

Insufficient capitalization, coupled with limited cash flow due to low sales and profitability, means that there are also few resources for research and development purposes. In turn there is little effort put into new product development or improvement of existing products, or adaptation or adoption of new technologies.

Content

Much of the content of Canadian databases is Canadian. But the information needs of Canadian business are not limited to Canadian data. Moreover, the international market for Canadian information is somewhat limited.

This has two key implications: first, it means that the export potential of the industry in Canada will remain limited as long as it maintains a dominant Canadian content focus; and second, the domestic market orientation which results increases the importance of the market size argument raised in the discussion of demand issues.

Standards

Suppliers have, to date, failed to agree on a common set of standards or protocols for access and use of databases. In fact, in many cases, unique protocols have been deliberately adopted in the belief that this will "tie" customers to a particular system. This argument may have some validity for the individual supplier if they are able to attract a large enough customer base. But, when all producers act in the same way, the result is an inefficient fragmentation of the market with negative consequences which lead to user frustration, ultimate dissatisfaction and a disincentive to casual use.

It should be noted that Canada is not unique on this standards issue; there are no international standards as yet for many of the same reasons, Until there are international standards, the room for unilateral adoption of common standards in Canada is limited.

Telecommunications

The telecommunications system may be a barrier to the use of online systems because of:

- the level of communications charges
- low baud rates when using the public switched voice network in any part of the transaction

The level of communications charges, a particular problem of those whose centres are not serviced by Datapac, is being addressed in part as the prospect of competition in the long-distance market causes the telephone companies to lower long distance rates. The arrival of competition would create further pressure for long distance rates to fall.

Datapac rates and/or leased line prices are also of concern to some, although it does not appear that these prices are a serious impediment to use.

Concern for lower baud rates will only be alleviated with the universal availability of ISDN, although this is still some years off.

Pricing

The pricing structure for database services typically involves a connect time charge based on a per hour or per minute rate and, often, a charge per piece of information retrieved. This pricing structure is a disincentive to users for many reasons. The difficulty in properly estimating the price of a search in advance could lead to an incorrect estimate. Underestimation would benefit the supplier in the short term but the long term benefit is doubtful. Over-estimation, and a decision to go elsewhere for the information, would harm the supplier.

Most pricing also requires payment regardless of the success of the search (a given for the experienced online searcher, but difficult for the end-user to grasp). This contributes to a user mentality of "watching the meter" which, in turn, acts as a disincentive to use.

Government Information

Governments in Canada, especially the federal government, operate a number of database services which are either free or subsidized. Many database service suppliers regard this as unfair competition and see it as seriously eroding their own market base. CAN/OLE, operated by the Canada Institute for Scientific and Technical Information (CISTI) is particularly singled out for criticism in this respect, not only on the basis that it subsidizes its services, thereby undercutting commercial services, but also that it offers a number of foreign databases which is perceived as undercutting Canadian producers and suppliers.

In addition to the problem of government as a competitor, there is also a problem perceived by many in the industry regarding private sector use of government produced information. The Crown holds the copyright on all government information and therefore controls the terms on which it is made available to private firms for resale purposes in electronic format. Typically, the policy is to put proposals out for open tender. Many proposals, however, are developed by private interests in the first place, at their own expense. An idea for use of government information developed by a firm or individual is taken to the government, then finds its way to open tender and the bid may eventually be won by a competitor. Such a system ultimately creates a disincentive to proposal and new product development.

These various arguments regarding the impact of government as competitor and as a producer of information are not as clear-cut as industry spokespersons sometimes make them out to be.

Certainly there are a number of reasons which can be advanced in defence of these government policies. Nonetheless, there is no question that the government subsidization of database users of, for example, CAN/OLE, does hurt the commercial database sector, both in terms of the direct effect on usage and profitability and in terms of the indirect effect of reinforcing attitudes that commercial services are over-priced.

3. Conclusions

The preceding discussion of barriers to development of the database industry in Canada has identified a number of issues on both the demand and supply side of the market, which are, or are perceived to be, retarding the growth of the industry. Some of these are outside the scope of unilateral Canadian action to solve. This may be true, for example, regarding the foreign demand for Canadian content information or the size of the Canadian market. Even these cases, however, may be subject to partial remedy through Canadian efforts, as for example, through marketing campaigns abroad or an effort to increase the level of usage and the level of market penetration in Canada, even if there is nothing to be done with respect to the total market size.

If we consider the list of barriers closely, it is obvious that the majority are concerned with having the right product at the right price and being able to demonstrate the value of the product to the user.

Awareness and attitude problems, coupled with price considerations relative to value and quality, stand out as major factors on the demand side. For the producers and vendors of information, many of the problems stem from either a lack of attention to user needs or lack of sales which in turn are a function of demand.

Thus, the user factor stands out as perhaps the single most important element requiring attention.

E. CDPI: PURPOSE AND ACTIVITIES

The conclusions of preceding sections confirmed the need for, and the required focus of, a Canadian Database Promotion Initiative. They:

- established the legitimacy of the two principal arguments in favour of the development of an electronic database industry

- identified user needs as a primary focus for overcoming a number of the barriers presently inhibiting the development of the industry in Canada, the purpose of this focus being to stimulate the market for electronic database services in Canada

No consideration for alternatives to a market stimulation program has yet been given, but will be addressed subsequently. However, given the barriers to development which have been identified, the case for a market stimulation program presents itself as the most viable course of action.

Following is an analysis of the success criteria for the implementation of a Canadian Database Promotion Initiative.

1. Purpose and Objectives

The Canadian Database Promotion Initiative is a market stimulation program with the purpose of:

- developing and implementing programs and activities to increase awareness and stimulate the growth and development of the electronic database industry in Canada

Within this general purpose, CDPI will have two specific objectives:

- to stimulate the demand for electronic database services

- to encourage producers and suppliers of database services to respond in appropriate ways to the market opportunities resulting from the increase in demand

CDPI is intended to accomplish these objectives within a framework which pools industry and government resources aimed at enhancing the industry's performance and market acceptance on a national basis. Initially, at least, CDPI's primary focus will be the business market (including government as a buyer of database services) for electronic database services.

The specific mandate of CDPI is as follows:

- to promote broad sectoral awareness of the use and usefulness of database services as a means of enhancing the competitiveness of Canadian industry in the domestic and the international marketplace

- to coordinate and deliver to all regions of Canada, a multi-faceted industry support program to increase the utilization and supply of commercial database services

- to seek and encourage ways to respond to the needs of Canadian electronic information users, including, in particular, potential users

- to act to reduce barriers to the growth of the Canadian database industry

- to increase the Canadian content and focus of the Canadian database industry, while recognizing that the needs of Canadian business users are not limited to Canadian content and that, additionally, non-Canadian content will increase the export market potential of Canadian producers and suppliers of electronic database services

In each of these areas of responsibility, CDPI's role will be that of a facilitator or catalyst. CDPI is <u>not</u> intended to be, and should <u>not</u> become a substitute for,

the responsibility of individual suppliers or producers to market their own products and to serve their customers' needs. CDPI also is not, and should not be, an alternate source of supply for activities already available from, or capable of being provided by, the private sector.

In many respects, CDPI represents a generic marketing program, concentrating on building awareness of the benefits of electronic databases, identifying user needs, overcoming negative attitudes towards the use of electronic database services, and generally, building an understanding of the strategic importance of information and of the unique characteristics of electronic database services as a means of addressing the information needs of business users.

However, as we have seen in the foregoing discussion, the demand and supply of database services are inextricable bound together. Demand stimulation must be accompanied by supply response. This means that CDPI cannot be a wholly generic marketing effort; it must, of necessity, work with individual suppliers and bring together suppliers and users in a cooperative setting.

2. Programs and Activities

In order to accomplish its mandate and objectives, CDPI will undertake a number of individual programs and activities. Consultations concurred that these programs and activities must be flexible and capable of adapting to changing market circumstances and opportunities. Therefore the following represents a listing of generic programming types and some examples of programs which have been used in Canada or other countries and could be used as models for implementation.

The particular character of the programming must be more thoroughly defined by those responsible for the operation of CDPI once it is in place. Needs will vary from region to region and it is important to be closely attuned to both regional and sectoral needs.

Market (Supply and Demand) Analysis

The primary critical success factor which was mentioned during every consultation with government or user community representatives was the requirement to identify and address user needs with appropriate products and services.

All agreed that the necessary first step was the undertaking or facilitating, on an on-going basis, of market analysis aimed at:

- identifying the information needs of individual market segments

- investigating the capabilities and capacity of Canadian producers and suppliers to meet the needs of specific market segments (mapping the existing industry)

- assessing alternative marketing strategies for the promotion of database services, both generically and by individual services

- assessing alternative modes or mediums of information supply in relation to their suitability, both technically and economically, to meet the information needs of users

For example: the Department of Industry, Science and Technology Canada recently contracted the compilation of an Inventory of International Databases of Interest to the Medical Device Industry in Canada. This will be distributed, free of charge, to medical device companies as an awareness tool. If coupled with an information needs assessment study, this inventory of existing products, would serve as a tool for the information industry to identify possible information gaps and potential products.

The B.C. Business Network conducted a study of database user satisfaction and needs. If contracted through the CDPI, the results of this study would be of benefit to many non-competitive network and database developers across Canada.

The Information Market Observatory (IMO) of the IMPACT 2 Program of the Commission of European Communities is preparing an in-depth user survey to ascertain the means by which users access professional information and identify gaps requiring new initiatives. They are also keeping a permanent inventory of existing market data sources and intend to launch their own studies.

Awareness and Promotion

Based on the results of market analysis, the primary function of CDPI should be to promote increased awareness and understanding of the benefits and availability of electronic database services. Activities should be of two general types: targeted campaigns and generic campaigns.

Targeted

Targeted campaigns aimed at appropriately identified firms or target groups, such as industry or professional associations, and built on a knowledge of the information needs of these groups/firms matched by a knowledge of the capabilities and capacity of Canadian suppliers.

Industry associations and government suppliers to industry were most amenable to endorsing the delivery of an awareness program to specific groups.

For example: the Canadian Exporters Association has offered to support seminars on accessing information for exporters by providing the venues and by providing advertising within their newsletter and other mailings.

Generic

Generic campaigns aimed at enhancing general awareness of the strategic importance of information and of database services, particularly on the part of present non-users of database services.

Possible activities would include the preparation and/or placement of articles for publication in general business magazines, joint Canadian information industry exhibits at trade shows, business seminars, etc., and speakers to discuss the impact of the products and services of the electronic database industry on the competitive position of Canadian business. Coordination of these activities with marketing initiatives of individual producers/suppliers must be considered.

For example: The Technology Liaison Directorate of Industry Science and Technology Canada holds seminars and exhibitions in various locations across Canada to bring in small to medium sized technology firms. A recent ISTC Technology Show in Calgary included 3 seminars directly related to the use of databases for identifying technology opportunities and four exhibits were devoted to demonstrating electronic information retrieval.

An article in Vancouver's Business Report discussed thoroughly the virtues of accessing electronic databases for a competitive advantage and reviewed various ways to access it (SuZy, an information broker, their library, etc.).

Training and Education Programs

Responding to the needs of users involves more than ensuring that the content of services is appropriate; it also includes meeting the education and training needs of users with respect to the operation of the services.

In part, the technical characteristics of system operations are involved; however, part of it also involves providing users with the necessary training to allow proper use of the system.

User Seminars

Short training programs (modules) on, for example, the use of modems or the downloading of information could be delivered through a seminar presentation, by video or a computer based training package. Proper training in the use of electronic database services and the technology which supports them will increase the level of user comfort in using the services and hence increase use. This will also contribute to greater efficiency in the use of the services and hence increase the value of the services per dollar of expenditure.

Telecom Canada and EDI Education Canada are sponsoring a three day course for managers entitled "The Principals of Electronic Data Interchange". This is promoted and hosted by the telephone companies across the country. A similar program could be held on database use for competitive advantage and hosted by regional offices.

Formal Education Programs

A second area of training/education relates to school and post-secondary education programs designed to increase the computer, communications and database competency of the next generation of users. Insofar as attitudes and awareness are seen as major impediments to market growth at present, working to overcome these problems with the next generation represents a long-term solution to these problems. It must be emphasized that such long-term solutions are, in addition to, not a substitute for other activities aimed at short term solutions for the present generation of users.

For example, the recent CADAPSO backing, of a certification program for online searchers has facilitated the implementation of such a program which will eventually move across Canada.

A one-school trial program conducted by Statistics Canada to incorporate statistical information into the high school curricula enjoyed such success that it is being implemented in 40 schools across the country.

B.C. Educational Technology Centre is undertaking a 2 year pilot program to integrate telecommunications into the K-12 curriculum in the interior of B.C.

Supplier Programs

A third area of education/training activity involves the supply side of the market. Training programs for database suppliers on, for example, marketing

techniques, doing business in Europe, or the use of new production technologies or product presentation, may be of considerable benefit in improving the quality of the product and/or knowledge of and hence responsiveness to user needs.

CDPI's primary role in training/education programs should be to act as a facilitator or broker to ensure that the training needs of users or potential users are identified and can be met.

Private providers of such programs should then be contracted for actual delivery whenever possible. If there is no private supplier, only then should CDPI consider direct involvement in the provision of programming until a private supplier emerges.

For example, Simon Fraser University, executive MBA Program would like assistance in the training of their students outside of formal courses. The CDPI could work with them and the University Library to develop appropriate training tools, such as case studies and computer-based learning packages, and those tools could then be used by other MBA programs.

Clearinghouse

There is a need for a centrally coordinated clearinghouse which is accessible from each CDPI office and, potentially, its affiliates. The clearinghouse would act as an agent for the dissemination of information to users and potential users on:

- seminars, programs activities
- industry products and services
- developments in the database industry

and to the information industry on:

- user needs
- market opportunities
- industry developments in other countries
- government and venture capital financing sources
- government tenders

Part of these functions will be filled by the on-going interface between CDPI and both sides of the market. But there is also a need for an explicit clearinghouse function, with goals as set out above, that can be easily accessed by any interested party.

One possibility for this would be the establishment of an electronic service which links existing database directory services, carries the types of information listed above, provides an expertise and service directory, and electronic conferencing and mailbox services.

The year old IMPACT program of the Commission of European Communities facilitated the interconnection of German and French videotex services which opened up new perspectives for closed populations of users. Further interconnections are being encouraged.

Other forms of dissemination will also be necessary, including an 800 service for those without electronic access capabilities, and published sources of information.

For example, the Commission of European Communities (SME TaskForce) has published a directory entitled Data Banks of Interest to SMEs.

Networking

There is also a need for a mechanism which will facilitate direct communication between suppliers on the one hand and users on the other, as well as amongst suppliers/producers and amongst users. This interaction is of the generic type, ie., it is not an attempt to usurp the direct communication which takes place when a direct client relationship already exists and should not be seen or used as such.

Additionally, CDPI itself will require some form of networking between its various offices and personnel and with its various contacts both in the industry and the user community, ie., for purposes of carrying out its internal management and client service functions.

Many of these networking requirements can be fulfilled through the network discussed above as part of the clearinghouse function.

Again, however, it must be recognized that an electronic service by itself will not be adequate for addressing these needs, especially on the prospective user side of the equation. Hence, other complementary mechanisms for interactive contact between users, suppliers and researchers (e.g., periodic meetings, conferences, workshops, etc.) must be also used.

It is also important that the networking component ensure close ties between other Canadian initiatives, as well as international bodies with similar objectives and encourage strategic alliances. Canadian initiatives include VISION 2000, ISnet, and the many provincial networks that tie into it as well as the organizations that exist to foster information technology such as CADAPSO, Canadian Advanced Technology Association, Information Technology Association of Canada and the Canadian Library Association. International bonds should be strengthened by representation to conferences and symposia and missions to foreign countries.

The study consultations proved an excellent demonstration of the need and viability of the CDPI as a vehicle for networking. On numerous occasions the consultants found themselves acting as a much needed catalyst for the sharing and transfer of expertise which would ultimately benefit the industry as a whole.

In the Japanese community - such a large number of local database promotion associations have been formed across the country to encourage and support networking that the Society of Database Promotion Organizations was formed in May, 1989.

Research and Development

For reasons which have to do with size and limited financial resources, there is little research and development (R&D) taking place in the present database industry in Canada. Research and development is important both in terms of its potential for generating usable products or technologies or improving existing ones and, indirectly, as a symbol of a healthy and energetic industry. The lack of a major R&D effort is both cause and effect of the problems of the industry.

Much of the research which is taking place in universities and government research laboratories is not always known or available to the industry for commercial development purposes. The market studies which CDPI should undertake will identify new product and/or technology requirements which will require some form of research to implement. Technology transfer mechanisms should be put in place and strategic alliances between small and medium sized enterprises, as well as large corporations, should be encouraged.

The CDPI is not seen as a research funding agency. But it can play an important role in:

- identifying research of relevance to the database industry which is currently taking place
- identifying new research opportunities in response to identified user needs
- encouraging producers and suppliers to participate in research activities
- acting as a focal point for bringing together researchers from various sectors to work together to explore new market opportunities
- providing support to industry efforts to gain government R&D funds for the database industry

The European Commission is using the support of pilot and demonstration projects as one of their main instruments to boost strategic information initiatives.

The demonstration phase of the Newfoundland and Labrador "Enterprise Network" includes a $1.6 million database development fund to encourage new database development.

Standards

The need for common standards was identified as a matter of some priority, constrained, however, by the recognition that

common standards were not an issue open to unilateral Canadian action. Canada is already represented in various international organizations which deal with standards issues and there is no suggestion that CDPI should take on this role. CDPI can, however, provide advice and information to both official representatives as well as industry associations, etc. on standards issues under discussion and provide watching briefs on these issues for its own clients. Through its clearinghouse and network functions, it can be an important source of information and direct supplier/user input to those who are responsible for standards issues.

As a footnote to this point, it should be recognized that the standards problem from the user perspective, can be solved not only through the adoption of common standards but also through the development of gateway services which make differences in standards transparent to the user. For example, two services currently available in Canada are SuZy (a PC based product) and the network-based, ALEX of Bell Canada. The use of these services is encouraged by the decision of IBM to bundle the communication software for both into their new PSI computer. CDPI could, in its research role and through its awareness and promotion activities, encourage the further development and use of such services.

The European Commission is mandated to support demonstration projects, to promote the application of information standards and to demonstrate their benefits.

All of these programs, activities and functions of CDPI as just reviewed should be seen as tentative and subject to further refinement and definition once CDPI is operational. As such, they are indicative of the types of activities CDPI might engage in rather than being definitive or prescriptive. They do, however, follow directly from many of the barriers to development of the industry which were identified in the last chapter and they are consistent with or directly follow from the mandate and objectives which have been set out for CDPI. What remains in this part of the discussion is the question of the viability of CDPI.

3. Conclusions

This section has outlined the purpose and objectives of CDPI together with its mandate and a list of suggested program areas. These program activities, as with the objectives and mandate, follow directly from the discussion of factors inhibiting the growth of the industry.

F. COST-BENEFIT ANALYSIS

The use of a cost-benefit analysis is one way of attempting to assess the viability of CDPI. Given the nature of the benefits in question as well as the uncertainties and risk factors involved, this methodology cannot be used to produce a quantified cost-benefit ratio. Nonetheless, as an analytic device, a cost-benefit framework can help to shed further light on the CDPI's viability.

For cost-benefit purposes, the first essential question to be addressed is whether Canadian initiated and unilateral action designed to stimulate the development and growth of the Canadian database industry is justifiable. Due to the qualitative nature of most of the benefits of CDPI, a cost-effectiveness approach is better suited for addressing the relative merits of alternative courses of action. The second essential question is whether CDPI or any other policy initiative taken unilaterally by Canada can be successful in creating a Canadian database industry. Desirability and feasibility are not the same thing.

1. Benefits

Under a scheme, which calls for joint financial participation from government and industry, it is important to consider the public or social benefits of CDPI as distinct from the private benefits. It is also important to consider the ability of private operators to capture the benefits for themselves based on their expenditure contributions to the effort. A comparison of expected benefits with expected costs will indicate whether the initiative is viable.

Information Industry Benefits

One of the problems with private firms directly undertaking the type of programs and activities which we have spelled out for CDPI is that, even if collectively all the benefits are captured by the industry, individually there is no way to assure that the benefits realized by any individual supplier or producer will match their contribution to the effort. By the same token, there is no way to prevent benefits being realized by firms which do not participate, and no incentive for a firm to contribute any particular share. In fact, there is a positive incentive not to participate if the firm believes that others will pay and in this case, no one pays and nothing happens. Thus, there is an incentive for government to be involved so that the benefits are captured equitably.

Societal Benefits

Part of the rationale for CDPI rests on the argument of the strategic importance of information, and of database services as a source of supply of that information. Information and database services create spillover or externality effects, benefits which are not captured, in whole or in part, by the vendors of information in general and database services in particular.

The presence of external factors means that the social benefits of information (and database services) will be greater than the private benefits of the information to the vendor.

Income and Employment

The second part of the rationale for a Canadian database industry is concerned with the benefits of the industry itself in terms of its income and employment effects. If we accept that first, the industry is presently underdeveloped and second, that the remedy for this lies in action which no individual producer on their own has an appropriate incentive to undertake due to an inability to retain the benefits of their efforts, then it follows that without an alternative source of support, the benefits that could be realized from a prosperous database industry will be lost.

Governments at all levels in Canada (as in most industrial countries) regularly provide assistance to industries on the basis of their employment and/or income generating capacity. They do so on the basis that growth and employment are accepted social goals of their countries/jurisdictions. This argument is as valid on these grounds for the database industry as it is for any other sector. When we consider the expected growth of importance of information-based activities, the argument for supporting the database industry becomes even stronger because it positions Canada to better seize all the opportunities inherent in the transformation to an information economy.

Social Transformation
One should not overlook the more general societal impact of a prosperous database industry relative to the transformation which is inherent in the Information economy. Although consumer services are not a direct focus of this study, to the extent that CDPI succeeds in raising the level of competency of Canadian business people and workers in computers and computer communications and enhances their appreciation of the value and role of information, it will have a salutary effect on the information skills, competency and awareness of the population at large, attributes that will be increasingly called for in all walks of life.

All of these benefits are of an obviously qualitative, intangible nature, not easily measured in numeric terms if they can be measured at all. Thus, the value of these benefits must be accepted without quantification but in the context of the trends in information and globalization now taking place.

One of the distinguishing features which is to be argued for CDPI is that it be user directed and its primary mission deal with the stimulation of demand for database services. This stimulation would take the form of an assessment of the overall information needs of users, the creation of user awareness of the value and strategic role of information, and an action plan to supply the information needs of users in the most efficient, cost-effective manner possible. These are largely generic concerns which, in themselves, do not preclude the use of alternative sources or mediums of information supply or require that a Canadian database industry exist. The strategic role which information will play in the economic era on which we are now embarking is, by itself, sufficient reason to justify the CDPI effort.

Accepting this argument, then any impact on the Canadian database industry itself is a bonus which adds little or nothing to the cost of CDPI. This is not to suggest that a Canadian database industry is not desirable but simply to argue that to the extent that we cannot definitively prove its viability, the case for CDPI does not disappear. Canadian businesses must be prepared to compete in the new world economy and information skills and awareness are necessary parts of such preparation.

2. Cost-Effectiveness

The following provides detail on the aggregate costs projected for CDPI. These figures are driven, to a large extent, by a recognition of the budget constraints of the potential funding sources subject to an estimate of the minimum requirements necessary for CDPI to work. It is beyond the scope of this study to try to go further. Detailed decisions on CDPI's activities and relative priorities will be up to those responsible for CDPI planning, and will force greater examination of costs.

Given a projected funding level for CDPI of $2 million dollars per year for five years, and recalling that Dow-Jones Information Services recorded a 1989 operating income of $214.1 million (US), the CDPI needs to produce only one-hundredth of a Dow-Jones to break even.

The cost-effectiveness analysis of the CDPI will address the relative merits of CDPI versus alternative approaches to the development of a Canadian database industry.

Alternatives to CDPI

- Direct government support for database producers and suppliers in the form of grants, subsidies or tax incentives. These types of programs, traditionally, have been very popular in Canada both in dealing with particular industries and in regional development programs.

- Government backing or direct provision by government of financing for the database industry. Again there is precedent for this in such industries as agriculture.

- The use of government information as a lever for the development of the private database industry, by turning over commercial rights for the sale of government information in electronic form to the private sector.

- The adoption of an explicit policy of government purchases of Canadian database products.

These alternatives are not necessarily mutually exclusive from CDPI. CDPI should not be seen as the only form of support from which the database industry would benefit. The above could also be included, in part, in the overall scheme of the CDPI.

Comparison of Alternatives

All of the alternatives listed adopt a producer focus rather than a user focus. It was a user focus which our analysis of barriers demonstrated was essential for stimulation of the market and which was emphasized throughout the consultations.

Grants and subsidy programs do not stimulate the market, they create an artificial market. The long-term success of the Canadian database market depends on building an industry which is competitive by world market standards. Grants do not do this. Neither does a program of required purchases by government. Unless the products are suited to the specific needs of government users, such a program becomes only a form of disguised subsidies. If the products are tailored, and if this is the only action taken, then the suitability for business needs will be questionable at best.

Grants or Subsidies

Grant or subsidy programs have not, in general, had a very good track record. Because they create artificial markets, the result often has been to create firms and industries which cannot survive without a continuation of the subsidy in perpetuity. Such firms, by definition, are not competitive by world market standards. Moreover, such programs are not cost-effective when the entire future stream of costs is taken into account. CDPI is seen as a limited life program, initially for a five year period only. In assessing its cost-effectiveness relative to these other alternatives, this is an important point to bear in mind.

Government Financing

The option of government financing or government loan guarantees has virtue insofar as firms are presently under-capitalized partially due to an

inability to raise funding in the normal commercial capital market. But again, compared to CDPI, this does not do anything for solving the demand side problems which have been identified. Of the four alternatives to CDPI listed, however, this one is perhaps that which is most deserving of consideration as a complementary program to CDPI. In Japan, the financing of projects under the Database Promotion Centre is handled (upon recommendation from MITI) by the Japanese Development Bank.

Government Information

The issue of turning over government information to the private sector for commercial sale, at least in electronic form, is complex. There are many arguments both for and against such a strategy. But for present purposes, such a strategy, by itself, will not provide a complete answer. First, Canadian business information needs are not limited to government produced information. Second, and most important, such a policy does nothing to solve the demand side problems which have been identified. A review of government policy regarding the use of government information by electronic database vendors is in order and there has, in fact, been a recent report on this subject commissioned by the Department of Communications. But this policy alone does not attack the basic problems.

Government Procurement

Government procurement of database services can be an important cornerstone in the development of a Canadian database market, but only if it is not forced and only if it does not exclude the crucially important attention to private business needs.

The foregoing discussion demonstrates that CDPI appears to have greater merit as an approach to the stimulation of the database industry in Canada than any of the alternatives. The cost of the alternatives are unlikely to be less than the

CDPI except perhaps the loan guarantee program (the cost of this being a function of how many of the guarantees must be honoured). Moreover, if we relax our assumption of equal benefits and ask which program is likely to produce the greatest benefits, the CDPI is clearly ahead.

3. Conclusions

This section has considered the benefits of CDPI in the context of whether a positive action to develop a Canadian database industry is warranted and whether CDPI is a better approach than a number of other alternatives which might be suggested. In both cases, the conclusion reached is that CDPI is the most feasible and promising course of action open at the present time, with the qualification that other complementary actions are not ruled out by the creation of CDPI. With this conclusion in mind, we turn now to a discussion of the structure, financing, and operation of CDPI.

G. CDPI: STRUCTURE, ORGANIZATION AND FUNDING

Management, structure, participation, funding, control and location issues were all thoroughly discussed by the study team in the consultations held with the industry, user groups, government and telecommunications carriers. Many of the issues received strong consensus on the issues and are so noted in the recommendations. However, where there was less unity on viewpoints, the consultants have weighed the arguments and arrived at a conclusion applicable at this time. It must be stressed that the issues should be reviewed and agreed upon by all with a stake in the future.

1. Participation

There was unanimous agreement that the CDPI would be of greatest value and strength if it were a joint undertaking of the information industry, users, carriers and government.

The inclusion of the information industry is obvious. The other three require some brief comment.

Users

Users have been identified as the primary focus of CDPI activities. The need to consult with users and to respond to user views regarding both content and technical features of services has been stressed. It therefore follows that selected user groups should be represented within the governance of the CDPI as a further way of ensuring that a user perspective is considered in the formulation of policy and activities for CDPI.

Carriers

Carriers are an essential part of the future success of the database industry since online services constitute the bulk of database offerings. Although CD-ROM has gained considerably in market share in the last two years, these relative growth rates are in part a reflection of the low starting base for CD-ROM because it is such a new commercial service. There is no question that online services will continue to dominate the industry for the foreseeable future.

Carriers are important because they provide an indispensable component of the service offered by the database industry. Aspects of carrier service have been identified as barriers to the development of the industry information and therefore, future solutions will require carrier compliance and involvement. Carriers also have a major financial stake in the ultimate development of a Canadian electronic database industry or, at least, in an expansion of the use of electronic database services, whether or not these are Canadian.

A final reason for inclusion of carriers is that they, potentially, may become database suppliers. Intelligent networks such as ALEX, a consumer service now undergoing commercial trial in Montreal and Toronto, and iNET, a gateway-type service, both represent already existing entries by the carriers into the supplier field. Given the financial resources of the carriers, in an industry otherwise suffering from under-capitalization, their involvement might in fact be of major advantage to the development and growth of the industry. There are, however, potential problems in allowing the carriers to become competitors of the firms who otherwise must rely on the carriers for the distribution of their own services. The case for involving the carriers in CDPI is clearly to provide a forum for the discussion of common concerns and increase the level of understanding between each segment.

Government

Finally, government involvement is crucial. Provincial and federal governments combined are the largest information provider in Canada and they have a role in the specification of information policy in Canada.

2. Control

Given the various participants, there is a need to specify which of these groups should have primary responsibility for the conduct of CDPI, both in terms of policy and the direction of activities.

All of those interviewed were virtually unanimous in the view that CDPI should be industry, not government, led. It was perceived that, for greater credibility in the business community, the CDPI should be led by private interests and that

it be run as a private sector oriented body. There was some concern that it not be carrier-led, both because of the potential tensions this might create with the industry and because the carriers, while essential to the success of the database industry, are not directly part of the industry and therefore may not share all the same objectives.

In order to achieve this control structure, CDPI should be established as a private, non-profit corporation, responsible to an Advisory Board whose membership includes all six groups of participants but with the majority drawn from industry.

Board members might be those who contribute funding, although voting rights would not be proportionate to the size of the financial contributions, especially for government.

3. Organization

The consultations resulted in consensus that one national office and multiple regional offices were preferred. They concluded that, to ensure regional equity and balance, the national office should function solely as a coordinator and facilitator of standard practices and procedures for the CDPI and the programming and market outreach should be performed in regional offices. The overall preferred structure would be an office in each province of varying size and autonomy (depending upon the needs of the province).

Although not unanimous, the majority favoured provincial offices rather than the traditional regional groupings. Provincial offices will be closer to the user-community and recognize resources (from database producers through to value-added resellers), business opportunities and user needs.

> National Electronic Information Network
> An initiative which promotes the use of Electronic Information would be remiss if it did not utilize appropriate computer communications media to compensate for Canada's unique concern for regionalization and take advantage of our national strength in communications technologies.
>
> A strategically developed electronic messaging and conferencing system would minimize the concern for the location of a National Office and enhance communications capabilities. Meetings in

person between both the Advisory Board and the National Coordinator and the National Coordinator and the Provincial Offices are essential but their frequency can be significantly reduced and effectiveness increased if such electronic media are used effectively.

The location of the national coordinator should be transparent to the market, who will deal directly with their provincial office or the affiliate closest to them.

The use of electronic conferencing has been proven to increase the efficiency of in-person meetings because of the capability of ongoing discussion and information dissemination between these meetings.

A network which links a well designed and moderated electronic conferencing system (deletion) and relevant databases, would provide the capability for constant communication between the National Coordination Office, the Advisory Board, and the regional offices.

To illustrate: the Advisory Board could have a conference for discussion of policy issues which would be open only to members of the board and the national coordinator. Provincial offices could have ongoing conferences for discussion of each of the programs of the CDPI. A electronic conference on generic awareness may include comments on how a provincial office succeeded in publishing an article on database usage in their local business journal or a question of colleagues on the most appropriate contact in a national organization to arrange for a local seminar. Whoever can answer the comment at the time may do so, and the information is archived and available at a later date for all conference attendees.

Such a communication mechanism is not inhibited by time zones, schedules, or location of the participants. The provincial offices would also be linked electronically to their affiliate offices throughout the province and certain conferences, electronic discussions, and databases would be shared by all. Ultimately, the user community (market) could link to the clearinghouse.

Advisory Board

This Board would have responsibility for policy, planning and budgetary control. It should be comprised of members of each of the following groups:

- Information Industry (3)
- Telecommunication Companies (1)
- Hardware/Software Companies/Publishers (1)
- User Groups (Industry Associations, etc) (1)
- Federal Government (1)
- Provincial Governments (1)

A suggested number of members from each group follows in brackets. All consulted agreed to a greater number of information industry participants than any other group but not a majority.

If appropriate, each participating group may strike their own industry/government committee to select their participant on the Advisory Board and ensure adequate representation.

National Coordinating Office

The National Coordination Office would have operational control and fiscal responsibility. The responsibility for development of CDPI standard practices and procedures, regional coordination, monitoring and overall clearinghouse activities rest in this office.

Provincial Offices

Each provincial office would hold fiscal responsibility within its own region. Each would be required to develop and maintain a profile of the region that they serve and present proposals for appropriate programs to meet those needs to the national coordinator. Following acceptance, they would facilitate or execute program development and implement programs (for those developed both internally and externally) within their region with the assistance of affiliates wherever possible.

By default, each provincial office will ultimately have specialization in one or more key subject areas. However, the fact that the Atlantic provinces developed a program on fisheries information sources should be transparent to those in Toronto who might have expressed interest in such an event.

Affiliates

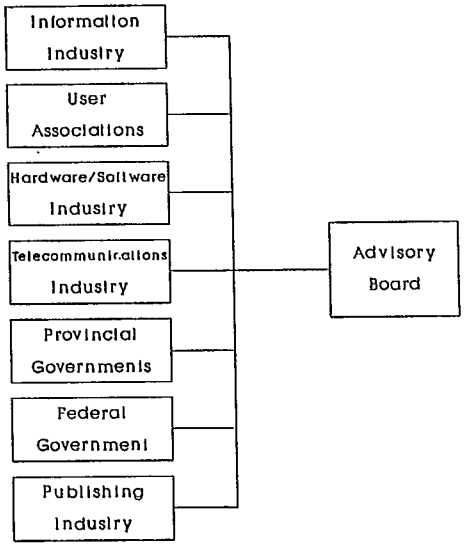
The number of affiliates will vary by province and be determined by the number of appropriate platforms which have the credibility of the business community and would serve a useful purpose. It is recommended that, in most cases, these existing groups provide materials and direction only but each should be trained in the standard practices of the CDPI.

Consultations concluded that the credibility and influence of potential affiliates varies within each region.

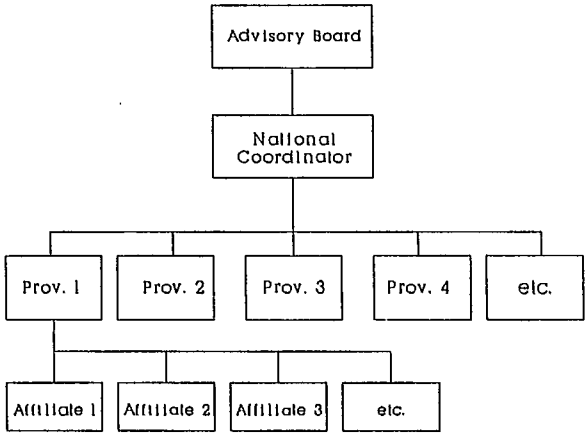
Provincial Research Organizations (PROs), Chambers of Commerce, Industry Associations, Economic Development Authorities, Small Business Incubators, Universities and Public Libraries are all potential affiliate organizations with comprehensive program directives in place: there is no need to restrict affiliates in any way.

The critical element for choice of appropriate affiliates will be their standing within the region and this must be determined through knowledge gained by regional office consultations throughout a particular jurisdiction.

CANADIAN DATABASE PROMOTION INITIATIVE
ADVISORY BOARD MEMBERSHIP



CANADIAN DATABASE PROMOTION INITIATIVE
ORGANIZATION STRUCTURE



4. Location

Given the recommendations regarding control and the network of regional offices, there is a question of whether CDPI should be an independent organization or one which is a branch or affiliate of an existing industry organization. Related to this, the question of where the regional offices of CDPI should be housed must be discussed.

These questions were addressed in the consultations, again with somewhat mixed results. On balance, however, the study team is of the view that CDPI should be established as an independent organization rather than as an arm, even at some length, of an existing organization. If CDPI was to be an affiliate or arm of another body, CADAPSO would be an obvious choice. This is not recommended, however, because it is viewed that any such relationship will always have the potential for a conflict in objectives or priorities and it contradicts the need for CDPI to be perceived as an independent source of advice and counsel on the part of its user client base.

In a similar vein, it is recommended that the regional offices of CDPI be independently housed rather than being hosted by existing local organizations such as provincial research offices, which was one of the options raised in the consultations. It is believed important that CDPI establish its own identity. Moreover, the correspondent network recommendation will give these potential host organizations a defined role in CDPI.

The location of regional offices will be dependent upon the results of in-depth consultations by the National Coordinator.

5. Phasing

Following the determination of goals and objectives and the appointment of the Advisory Board, it is recommended that the National Coordinator be hired to begin the development of standard practices and procedures. This individual would devote a great deal of the first few months to consultations in each region to discuss regional opportunities, resources, and concerns with those within both the information industry and the market.

It is recommended that regional offices be phased in slowly after standard practices and procedures have been established.

The choice for the first five offices will be determined through consultation and agreement between the National Coordinator and the Advisory Board. These offices will be phased in slowly, the first no earlier than 6 months following start up of the initiative.

6. Staffing

National Coordinator
Crucial to the success of the CDPI, this individual must have extensive experience within the information or peripheral industries and have credibility across all sectors.

He or she must be a dynamic industry "Champion", have excellent communication and listening skills, and be willing to travel extensively (especially for the first year of operations).

Regional Coordinators
Each regional coordinator must have similar skills to the National Coordinator. They must have a good knowledge of the regional attributes and it would be beneficial if they brought to the position a network of contacts within their region.

Support Staff
Utilizing the current computer and communication technologies, the need for clerical staff is reduced. An Administrative Assistant will be required for each office and additional staff will be determined within the business planning stage. All project and technical assistance could be contracted out as needed.

7. Funding Formula

There are two aspects to the funding issue which need to be addressed:

- sources and relative contributions of funding
- total funding requirements

A relatively high level of government funding will be essential for CDPI to succeed over the proposed initial five year period of operation. The lack of funds of many industry firms, and the high generic quality of much of the expected outcome of the CDPI constitute reasons for the necessity for such an involvement.

It is also true that the private sector must contribute something if it is to have a real stake in CDPI. Collectively at least, the private sector, as well as the carriers will gain considerable financial benefit if CDPI succeeds in accomplishing it objectives.

In Japan, a radically different political environment, the Database Promotion Centre is funded solely by the Ministry of International Trade and Industry (MITI). However, it is partly staffed by people from the private sector.

This may, perhaps, suggest a form of in-kind contribution which could be considered from the Canadian information industry.

What is proposed, therefore, given both of these considerations, is joint funding, with a majority share coming from government for the first three years and declining thereafter to a minority position by year 5. More specifically, it is proposed that:

- government contribute 70% of the financial requirements of CDPI for the first three years of operation, with the remaining 30% coming from industry and carrier sources as well as user fees

- the government contribution decline to 50% in year 4 and 30% in year 5

By the end of year 3, the potential success of the CDPI should be evident. If it is successful there will be a strong incentive for the industry and the carriers, collectively, to arrive at an appropriate arrangement for assuming a greater share of the costs of CDPI themselves. Should there be a positive decision for the CDPI to carry on after year 5, then it should be expected that it would become wholly financed from private sources.

User Fees

The majority of those consulted were in favour of user fees for any "value added" services (such as training programs, etc.) offered by, or facilitated by, the CDPI.

Certainly, CDPI should not try to charge for its basic promotion activities (phone calls, directional request, etc.). To do so would be counter-productive to its primary objectives. On the other hand, where it carries out tasks for individual firms, such as an information needs assessment, there is a case to be made for recovering its out-of-pocket expenses.

CDPI should not be guilty of reinforcing attitudes about the value of information by providing value-added services free of charge.

There is a fine line to be walked in deciding whether to charge user fees and if so, in which cases and for which services. User fees will not be, however, a major revenue source for CDPI under almost any circumstances.

Required Funding

The European Economic Community, in considering a similar type of information services market stimulation program in the late 1980s proposed an annual expenditure level of approximately $25 million (CAN) annually. The Japanese Database Promotion Centre has an annual funding allocation of approximately $3 million (CAN). If we put these numbers in relative perspective to Canada in terms of population and market size, while recognizing that direct proportionality cannot be expected because of the fixed costs of administering the organization and recognizing also the realistic budget constraints of the potential contributors, a figure of between $1.5 and $2.1 million annually is recommended for CDPI.

Budget Funding

	Year 1 1 Ntnl Coord. 5 Prov.	Year 2 1 Ntnl Coord. 10 Prov.	Year 3 1 Ntnl Coord. 10 Prov.
Salaries	$250,000	$600,000	$625.000
Rent	$ 50,000	$100,000	$115,000
Equip. Purchase and Supplies	$ 80,000	$ 40,000	$ 60,000
Telecomm.	$ 50,000	$100,000	$115,000
Travel	$ 70,000	$ 90,000	$200,000
Programming	$500,000	$930,000	$1,000,000
TOTAL	$1,000,000	$1,860,000	$2,115,000

Staff Requirements

National Coordinating Office	National Coordinator Administrative Assistant Receptionist/Clerk
Provincial Offices	Provincial Coordinator Administrative Assistant

It must be emphasized that this number is highly arbitrary. It is not based on any attempt to cost the programs recommended for CDPI. This was simply not possible, both because much of the detail of these programs has been left to CDPI itself to define and because there is a great deal of discretion involved in deciding how much to spend on individual activities. These would be defined through the Business Plan.

If the figure of $2.1 million is accepted, then government's share (including both federal and provincial governments) would be $3.5 over the first three years and $1.05 and $.6 million in the last two years, for a five year total of $5.15 million. Industry and carrier contributions would be $3.6 million over five years. Annually, the private sector would be contributing an average of $720,000, although this figure would be smaller in the first three years and larger in the last two years. On a per capita basis, counting both industry firms and carriers, this should not be an unrealizable figure.

H. RECOMMENDATIONS

1. The establishment of a Canadian Database Promotion Initiative to stimulate the growth and development of the database industry in Canada is recommended.

Over the long term, this initiative could be used as a model for the promotion of other kinds of electronic services.

2. The objectives of the initiative would be to stimulate demand for such services and to encourage producers and suppliers to respond in appropriate ways to market opportunities resulting from increased demand.

3. The mandate of the CDPI should be:

- to promote broad sectoral awareness of the use and usefulness of database services as a means of enhancing the competitiveness of Canadian industry in the domestic and the international marketplace

- to coordinate and deliver to all regions of Canada, a multi-faceted industry support program to increase the utilization and supply of commercial database services

- to seek and encourage ways to respond to the needs of Canadian electronic information users, including, in particular, potential users

- to act to reduce barriers to the growth of the Canadian database industry

- to increase the Canadian content and focus of the Canadian database industry, while recognizing that the needs of Canadian business users are not limited to Canadian content and that, additionally, non-Canadian content will increase the export market potential of Canadian producers and suppliers of electronic database services

4. The role of the CDPI in all of the above, should be of facilitator or catalyst. It should not duplicate, or compete with, existing programs.

5. The CDPI should not function independently of other national initiatives or organizations. It should ensure collaboration and sharing of ideas with initiatives such as ISnet, National Business Information Network, VISION 2000 and organizations that exist to foster information technology such as CADAPSO, Canadian Advanced Technology Association, Information Technology Association of Canada, and the Canadian Library Association.

6. The programs and activities of the Initiative to fulfil that mandate should include, but not necessarily be limited to:

- Market (Supply and Demand) Analysis
- Awareness and Promotion
- Training and Education Programs
- Clearinghouse
- Networking
- Research and Development
- Standards

7. The CDPI structure must be that of a joint undertaking consisting of representatives from the information industry, users groups, hardware, software and publishers, carriers and government.

8. The CDPI should be industry led and established as a private, non-profit corporation.

9. One national office would act as the coordinator and provincial offices would best ensure regional equity and balance.

10. It is recommended that a network be established which includes an electronic messaging and conferencing system to promote effective and efficient communication and information exchange.

11. Representation in CDPI would consist of:

- an Advisory Board, comprised of members from Information Industry, Telecommunication Companies, Hardware/Software Publishers, User Groups and Federal and Provincial Governments

- a National Coordinating Office responsible for operational control and fiscal matters, standards practices and procedures, regional coordination, monitoring and overall clearinghouse activities

- provincial offices responsible for developing and maintaining a profile of their appropriate region, facilitating or executing program development and implementing programs, with affiliate assistance, whenever possible

- affiliates would provide materials and direction, assist in program delivery, and be trained in the standard practices of the CDPI

12. It is the recommendation of the consultants that the location of the National Coordinating Office not be within central Canada; nor, as with the regional offices, housed with existing local organizations. A location within either the Prairie or Atlantic Provinces would provide minor economic benefit to the region, however, it would serve to increase the credibility of the growth and development of information based industry in regions requiring diversification.

13. It is recommended that the National Coordinator be hired and devote the first six months to consultation with all sectors across the country. The regional offices would be phased in slowly over months 7 through 24.

14. A budget of $1M is recommended for the first year of operation and $2M over the succeeding four years.

15. Funding is recommended to begin with 70% from government and 30% from industry in year one through three, reducing to 50% for both in year four and, finally, 30% government and 70% industry in year five.

16. It is recommended that controls to measure the success of the Initiative be implemented at appropriate intervals throughout the 5 years.

I. ACTION PLAN

1. It is recommended that a workshop be held at the earliest possible date to bring potential backers and supporters together.

At this time, the recommendations should be presented and the participants should be provided with the opportunity to rank CDPI goals in order of priority and set measures by which to determine the success of the Initiatives at pre-determined milestones.

This early involvement in the process should make potential supporters feel some pride of participation in the evolution of the Initiative.

2. Following the workshop, a formal Canadian Database Promotion Initiative Business Plan should be developed which takes an in-depth look at key economic benefits, structural concerns and in depth financial requirements.

3. The Business Plan should be distributed to all potential backers and requests for funding formally prepared.

4. Upon receipt of appropriate funding, The Canadian Database Promotion Initiative should be implemented.

APPENDIX 1
CONSULTATIONS

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Ludovic Celestin
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Project Coordinator

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B.C. Research
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President

New Brunswick Research and Productivity Council
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Nova Scotia Research Foundation Corporation
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Bob MacNeill, Vice President - Finance and Administration

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Saskatchewan Research Council
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President

Canadian Library Association
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Canadian Manufacturers Association
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Canadian Telematics Forum
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Information Technology Association of Canada
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Maxwell Online Inc.
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Micromedia
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Northern Telecom Canada Limited
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Dean - Faculty of Science

APPENDIX 2

CDPI Interview Guide

GENERAL QUESTIONS

Comments on the Concept Plan, identify their level of comprehension, clarify any questions they might have.

SPECIFIC QUESTIONS

CDPI Purpose and Rationale

- Is the Canadian database industry lagging that of other countries, in your estimation?

- Is there a need for a body responsible for promoting the Canadian database industry to Canadian business?

- What are the barriers to the use of database services by Canadian business?

- Should the promotion initiative be broader than just the database industry? (i.e. should it consider the promotion of the information use?)

Mandate

- Should the primary focus of a Canadian database industry be Canadian content or foreign content?

- Should the initiative serve U.S. firms doing business in Canada?

CDPI Activities and Strategies

- What should the functions (activities) of such a promotion body be, if formed?

- Should such an organization be bilingual - in its own work, in the

promotion of database development?

Market Studies

- Should a Canadian database industry be developed to primarily serve the domestic market or as an export industry?

- How well is the Canadian databases industry meeting the needs of a Canadian business at the present time?

Promotion/Awareness

- What business firms should be the primary target for this promotion initiative?
small, large, multinationals, exporters, national, regional?

Training and Education

- Should the promotion initiative be involved in training and education? If so, what should the focus of the programs be?

Clearinghouse

- Do you have any comments about the clearinghouse activity?

Networking

- Do you think that the networking activity is an important part of this initiative? If so, what do you believe is the best method of doing this?

Research Collaboration

- Do you feel that Research collaboration should be part of this initiative?

Standard Issues

- Should adherence to certain technical standards be a condition for membership in this organization?

Publishing

- What type of publishing, if any, do you see as necessary for this initiative?

Structure/Funding Scenarios

- Should the telecommunications carriers be part of such an organization?

Regional Structures

- Should regional representation/participation be assured? If so, how?

- Should programming vary by region, e.g. create database specializations by region?

- Are regional considerations consistent with the development of a viable national industry?

Funding Structures

- If such a body was to be formed, should it be funded by government, the industry, or both? If both, in what proportions?

- Should this organization have a system of user charges for specific services?

- (for users) What kinds of services would you be willing to pay for?

- (for suppliers) What kinds of services should there be charges for?

- (for suppliers) Would you be willing to contribute funding to this effort, independent of specific services you might make use of?

Management Controls

- If formed, irrespective of funding sources, should it be operated by government, industry, user or combination?

- Should government remain in the database business as it is at present

or should government information be sold through private operators? If so, should government charge private operators for this information?

Budget Considerations

- What level of funding should such an organization have over its first five years of operations?

APPENDIX 3

ROBERTSON-NICKERSON REPORT

Title Page and Executive Summary

THE CANADIAN ELECTRONIC DATABASE INDUSTRY:

IMPACT OF FOREIGN SERVICES AND CANADIAN COMPETITIVENESS

FINAL REPORT

Submitted to:

THE FEDERAL DEPARTMENT OF COMMUNICATIONS
AND
THE ONTARIO MINISTRY OF INDUSTRY, TRADE AND TECHNOLOGY

July 1990

By:

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EXECUTIVE SUMMARY

This study was undertaken to examine the Canadian Electronic database industry with respect to structure, competitiveness and the impact of foreign services. The majority of the report contains primary research and analysis and we have placed a heavy emphasis on industry consultations. The report covers, primarily, producers and supplier/vendors in the public online sector but other sectors such as CD ROM and floppy disk have been included where appropriate. We have also dealt specifically with Canadian content databases.

Some of the major observations are as follows:

1) The typical method of analyzing the growth of the industry, i.e., counting databases, has limited use because of the following factors:

   a) there is no standard for counting between countries;

   b) counting does not take into account the value of information or value-added;

   c) multiple databases have been counted as one and vice versa;

   d) inter-country comparisons in percentage terms have limited value in a high growth market and in comparing databases which have little value outside their own country; and

   e) there is no clear definition of a public online database.

In order to make these figures useful, standards must be set and limits to interpretation must be understood. This would be a useful agenda item at an international conference.

2) Canadian companies and organizations control the vast majority of Canadian content databases at both a producer and vendor level. The level of Canadian control increases with the level of Canadian content. Exceptions in specific areas of business/finance; forestry and pulp and paper are noted. This is likely due to the relative low international demand for Canadian information.

3) Overall, there is a low level of concentration amongst both producers and vendors, but there is concentration in certain subject areas.

4) Foreign competition is not viewed as a threat. The industry believes that any increased foreign presence will occur through acquisition, not competition. This could affect Canadian control in specific subject areas, but not likely to the industry as a whole.

5) There is an increasing number of French-language databases. These are mainly databases previously available in English only.

6) The industry is concentrated in the Toronto area and the National Capital Region.

7) Canada's ratio of profit to non-profit producers is roughly 48% to 52%, similar to Europe but lower than that of the US.

8) The industry views lack of awareness and the high cost of marketing as its major barrier to growth.

9) The industry would like to see clearer guidelines and easier access to government information and would like government to take the lead in the use of electronic information.

10) There are a number of strategic alliances in the industry but the existing level could be much higher.

11) A number of trends and opportunities are discussed.

12) Special CD ROM considerations are discussed. CD ROM is a non-traditional electronic medium in that it is both data and culturally-oriented with CD ROM companies often referring to themselves as publishers. CD ROM may be particularly vulnerable to US competition.

13) There is perceived growth for Canadian information both domestically and internationally (particularly due to increased potential for international trade). Overall, however, demand analysis is still largely intuitive rather than analytical.

14) A potential increase in reliance on US services would likely create a significant imbalance of trade in electronic information services, although this is difficult to quantify.

15) The government can play a significant role in the development of the industry, primarily as a coordinating body and to assist in areas where the industry's lack of critical mass is a problem. This can be achieved through an active role in generic marketing, promoting industry networking, infrastructure support, and access to information. The government could also undertake sectoral demand analysis for industry use.

APPENDIX 4

REFERENCES

1. Online databases in Europe: Textual-Numeric online database market: percent of revenues by country (Europe), 1986-1996." Research Studies - MIRC (April 1990): III-99.

2. Holland, Andrea. Information producers, suppliers and the end user - bridging the gap to the year 2000. Opening remarks. CADAPSO Conference '89 Proceedings.

3. Link Resources Corporation. Current situation and forecast of electronic information industry in Europe and North America 1989-1994. New York: LINK, 1989.

4. Computer Industry 1987. Statistics Canada (63 - 222) 1989.

5. Robertson-Nickerson Limited. The Canadian electronic information industry: Impact of foreign services and Canadian competitiveness. Final report. Ottawa, July, 1990.

6. Canadian usage of Canadian content vs US/International-content databases. Evans Research, July, 1989.