INTERDEPARTMENTAL TASK FORCE
ON
TRANSBORDER DATA FLOWS

# REPORT ON PUBLIC ONLINE INFORMATION RETRIEVAL SERVICES

prepared jointly for the
Working Group Economic Aspects
and the
Working Group Sovereignty Aspects

Prepared by:
Dr. Jake V. Th. Knoppers
Gestinfo Inc.

and

Dr. Prabir Neogi
Department of Communications
December, 1982



The contribution of Dr. Knoppers forms part of the tasks carried out for the Communications Economics Branch, Department of Communications, Ottawa, Canada, under Contract No. OST82-00105.

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This report forms a part of the work of the Canadian government's Interdepartmental Task Force on Transborder Data Flows (TBDF). Created in 1981, the Task Force was composed of officials from 20 government departments and agencies. The work of the Task Force was based on fact finding, analysis of available information, identifying issues and concerns, and extensive consultations with industry. During the two years of the Task Force's existence, a number of reports and background papers were produced; these have been made available to the public.

This report represents the views of its authors, not those of the Task Force or the Department of Communications. It deals with a dynamic area characterized by a rapidly changing environment of technology, products and company structures. The information presented in this report was accurate when collected, but is subject to rapid change.

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# A. INTRODUCTION

## 1. BACKGROUND, PURPOSE OF REPORT AND LIMITATIONS

The purpose of this section is to place the report in its proper context. It does so by sketching the background, identifying the purpose and noting the limitations of this study.

### 1.1 Background

While some have been predicting the advent of the "information revolution" or the "electronic revolution" for a quarter of a century, it is only during the last few years that this "revolution" has become an imminent reality. Order of magnitude decreases in computer processing and storage costs combined with equally rapid technological advances in telecommunications and communication networks, have been the primary factors in the appearance of the "information industry".

Information has always been a saleable commodity and it has been used to improve the decision making process. The role of information has grown steadily in post-industrial societies, as an increasing share of the work force becomes information workers and an ever-increasing number of firms and individuals become consumers of information. For others, information is now considered to be the fourth factor of production or the fourth element to be managed. While discussion of these concepts is already in full flower and in some cases are actually being applied, the fact remains that the stock of information or data itself is growing at an exponential rate. Some estimates indicate that between 1970 and 1985, the world's stock of information will have grown in volume between four and seven times.

This growth is the result of a complex mix of demand and supply factors:

- the expansion of science (i.e. new fields of scientific inquiry);
- the linking of science to the new technologies and the increasing importance of technology to science;

- the increase in population (i.e. the effect of the post-war baby boom and lower infant mortality);
- greater literacy and more schooling (i.e. the expansionary boom in post-secondary education);
- the growing demand for news, entertainment, information and knowledge;
- the establishment of "real-time" communication and world-wide communication links of computer networks with greatly increased data flow capacity (i.e. telephone, cable, satellites, some of the latter having transmission rates of over 6 million bits per second per transponder);
- the quantum decreases in data processing and data storage costs.

In a wider context, the recent rapid evolutionary or revolutionary change of converging computer-communication technology, reductions in per unit costs and an increasing supply of data have by their very nature led to a tremendous increase in the volume and extensiveness of electronic data flows.

These data flows form the arteries of the "Global Village". As advances in computer-communications networks link nations more closely together, the question arises as to what effect this transformation has or may have on the nation-state. International organizations such as the U.N., the Council of Europe and the OECD and a number of European nations have already formulated either laws, regulations, guidelines, mandatory or voluntary, etc. dealing with particular aspects of transborder data flows (TBDF).

An increasing amount of information is no longer handled by means of the traditional printed word. To remain useable and to be delivered where and when required, it is created, stored, manipulated, accessed and transmitted by electronic means. This major change in the way information can be collected, packaged and distributed has led to the emergence of a new industry based on the use of on-line databases, huge banks of data or information that are processed, stored and retrieved electronically.

On February 26, 1981 an Inter-Departmental Task Force was established to study the implications of rapidly increasing Transborder Data Flows (TBDF) for the Canadian economy and for Canada's sovereignty. The Task Force Steering

Committee established three Working Groups, with respective responsibility for the analysis of the economic impacts of TBDF, the sovereignty impacts and the international environment.

The present project on Public Online Information Retrieval Services is a joint undertaking of the Economic and Sovereignty Working Groups. It represents a combination of the work started under the Information Retrieval Services project of the Economic Working Group with that of the Cultural Aspects team of the Sovereignty Working Group. The study team considers that this joint approach will yield a better understanding of the facts, issues and problems related to Public Online Information Retrieval Services than two individual studies. This is because one must study the content as well as the economic aspects of such services, usage, access and delivery, since it is the content or the information, i.e. package, that is being sold and bought in this industry, not the technology as such. Content poses issues related to both economics and cultural sovereignty.

## 1.2 Purpose of the Report

The purpose of this report is to study the Public Online Information Retrieval Services "industry" in the U.S., European and Canadian context and to identify issues of concern. The bulk of the analysis relates to the structure and economics of the "industry". Cultural/sovereignty and institutional/legal issues are also identified.

The tasks related to the economic analysis have been formulated as follows:

i) Define the industry and its boundaries:
ii) Undertake a preliminary survey of the available literature and identify the data, if any, upon which quantitative analyses may be based;
iii) Study the structure of the industry and identify distinct sub-markets if they exist;
iv) Calculate order-of-magnitude estimates regarding the size and growth trends of the Public Online Information Retrieval Services market in the U.S., Europe and Canada;

v) Analyze the relative sizes and growth trends of the sub-markets, within the limitations of the existing data;

vi) Identify the nature and direction of transborder flows of Information Services, to the extent possible from available information.

An attempt has also been made to identify the main Canadian database producers and vendors and compile an inventory of their service offerings. The producers and vendors identified are discussed in this report. The inventory of databases currently being accessed by Canadians, based upon existing directories and sources, is detailed in a voluminous companion document which forms an appendix to this main report and represents the first such effort of its kind for Canada.

In addition to analyzing the above types of "factual" information, the report examines concerns expressed by Canadian database producers, vendors and some end users based on interviews, consultations, briefs and discussions with the Industry Advisory Committee. The purpose of this exercise is to identify the major issues and problems related to both the supply and the demand sides of the Public Online Information Retrieval Services industry, and the impacts that TBDF is likely to have on both Canadian suppliers and users of such services.

## 1.3 Limitations of the Report

This report suffers from a number of limitations. These arise from the time and resource constraints under which it was prepared; the lack of meaningful demand data and the inability to collect such data by mounting a survey of users; and, finally, by the fact that it is the first extensive analysis of the Public Online Information Retrieval Services industry in Canada. With the exception of the recently published Evans Report on Public Databases, there is no available document against which even the broad conclusions and findings of this report regarding the Canadian industry can be compared and tested. Considerable further work will be required in this area before a comprehensive picture of the Canadian Public Online Information Retrieval Services industry, consisting of both the demand and supply sides, can be created and the problems studied in-depth.

It should also be noted that Public Online Information Retrieval Services is only one of the many subsets of the much larger and more extensive online network services industry, which includes both transactional and information services. However, a discussion of the "information industry" as a whole cannot be undertaken without introducing the issue of privacy. As the federal government is currently in the process of formulating new principles and privacy rights for personal information under its control (i.e. Access to Information and Privacy Legislation or Bill C-43), it was considered premature for the Task Force to consider privacy issues at this stage.

Nevertheless, the Public Online Information Services Industry, even though it presents only a relatively small subset of the information industry, presents a complex enough problem of analysis as is demonstrated by this report.

Finally, this report focuses on the public online service industry and in doing so does includes estimates for total revenues of computer service bureaus. However, those wishing to study the latter in detail should consult the Task Force's Report on Data Processing (Ref. A19).

## B. INDUSTRY STRUCTURE AND TRENDS

### 2. DEFINITION OF INDUSTRY AND BOUNDARIES

The term "Information Services" must be given a workable definition and clear boundaries, before any meaningful measurement of this "industry" is possible. In particular, one must realize that such services constitute only a subset of the existing and potential uses of online databases.

The online mode of use is characterized by the following components:

a) user terminals, often intelligent, which provide input/output, communications and, often, some local processing capabilities;
b) a telecommunications network linking terminals to one or more central computers;
c) powerful timesharing computers with appropriate applications software capable of organizing large databases, flexible searching and retrieving the information sought by the user;
d) large databases stored online and accessed/queried interactively. (Data files or data sets used in a batch processing mode are therefore excluded).

The explosion in the use of online database during the last 10 years has been due to major improvements in the price/performance of computers, online storage technology, the emergence of reliable telecommunications networks designed for data transmission and the development of reliable database management applications software. The huge increase in the amount of source information created and/or captured in electronic machine-readable form has also spurred the development of online databases. The increasing use of word processors in offices, the extensive use of computers to maintain organizational records and the automation of the print publishing process (using photocomposition and automated type-setting) means that an ever-increasing proportion of source information is now created in electronic form, rather than hard copy. Combined with the use of optical character recognition (OCR) for converting printed information into electronic form, this means that the cost of creating

machine readable input for online databases is greatly reduced, thereby removing an important economic barrier.

## 2.1 Information Retrieval and Transaction Processing

The use of online databases can be categorized into two broad modes: information retrieval and transaction processing. In the information retrieval mode, the end user is restricted to searching and retrieving information from the database. He cannot initiate a transaction which can change the content of the database; updating is rigidly controlled by the database vendor. All public online information retrieval services, which must provide widespread access, operate in the information retrieval mode.

In the transaction processing mode, the end user can initiate a transaction which, when processed, changes the status of the database. Systems used for inventory management, airline reservations, online banking, point-of-sale services and many other applications fall into this category. All transaction processing systems have secondary information retrieval capabilities, through the use of query transactions. Such systems have generally been used for intra-company or closed user group applications; but with the spread of teleshopping, telebanking and EFTS (Electronic Funds Transfer Systems), the semi-public use of such systems is likely to become widespread over the next decade. The transaction processing mode probably forms the bulk of intra-company and closed user group applications, but this form of use does not normally result in distinct market transactions. It is buried or dispersed in the total EDP, communications, library and other information related (e.g. marketing) expenditures of organizations. Expenditures associated with the transaction processing mode of use, within firms and closed user groups, could well be 5-10 times larger than those associated with public online information services in Canada.

This study will focus upon the information retrieval rather than the transaction processing mode of using online databases. The analysis of public online information services will be primarily concerned with the public use of online databases in this mode. This is because public transactional databases

are still in their infancy, and there is very little available information in this area. It should be noted, however, that videotex based services, e.g. Telidon, are being designed to provide transactional capabilities. In fact, the success of such services may very well depend upon their transactional and gateway capabilities. This point is discussed further in section 5 and Appendix E.

## 2.2 Industry Structure

The public online information retrieval services "industry" consists of five principal groups of players: the information providers, database producers, database distributors or vendors, information brokers and the users. Telecommunications carriers play a key support role by providing the data networks linking the user terminals to the central computers of the vendors, but they will be considered a supplier of facilities and services to the "industry" rather than an integral component.

a) Information providers are the organizations which originate or create information. They include the learned societies, professional organizations, abstracting services, news services, research organizations and government agencies as well as individuals and corporations. The information may or may not be created in electronic machine-readable form. If the information provider creates the information in machine readable form, he may also become the database producer, either in a primary role or as a spin-off to a primary hard-copy product.

b) Database producers are the organizations or individuals responsible for the creation and updating of databases in machine readable form, using information supplied by the providers, which could be themselves. A wide variety of organizations produce databases, including government agencies, research firms, universities, print publishers, financial institutions and database specialists. The Canadian government is the largest single producer of public access databases in Canada, but this is not so in the U.S. It should be noted, however, that many of the

U.S. database producers and vendors, in their formative stages, relied heavily on contracts and funding provided by government agencies.

c) Database distributors or vendors are responsible for storing databases online, providing access/retrieval software and computer access via remote user terminals. The vendor buys from the producer the right to make the latter's database publicly available via the vendor's computer. The database producer may be paid in a variety of ways, such as a flat annual fee, royalties based on volume of usage, or both. In some special cases, the database producer may pay the vendor for the privilege of making his database widely accessible in electronic form.

Some vendors are computer service bureaus providing timesharing services who offer databases as a part of their total range of services to clients. Other vendors, like the search services, have as their main raison d'être the distribution of public databases. Some vendors, like I.P. Sharp Associates and Data Resources Inc. (DRI) operate their own private data networks. Almost all vendors now provide access via public data networks like Datapac, Telenet and Tymnet.

d) Information brokers act as an interface between the end user and the source of information, charging a fee for the service. Reference librarians have traditionally played this role, between end users and printed information in the past, and now the vendors of bibliographic databases, but they have not charged an explicit fee for the use of their services. A large number of fee-based information services have sprung up in the U.S. over the last 10-15 years, to cater to the requirements of the customer who needs specific information, but who is unable or unwilling to acquire it directly from the database vendors. There is an obvious analogy, and even overlap between such activities and traditional consultancy services.

e) End users are the buyers of information services, the entities to whom the distributors market their databases, either directly or through information brokers. The end users come from government agencies,

almost every segment of industry, financial institutions and professional service groups. Although the market is predominantly a business one and likely to remain so for the medium term, consumers may also eventually become significant users of online databases.

The information providers, database producers and vendors constitute the supply side of the Public Online Information Retrieval Services industry. Vertical relationships, formal or informal, are possible between the information providers and database producers, and also between the producers and vendors. An electronic publisher may undertake all three functions; examples would include the Globe and Mail, the New York Times and McGraw-Hill.

The end users and information brokers constitute the demand side of the industry. Since the end user of public online information retrieval services could be, potentially, any firm or even individual consumer, the demand side is difficult to survey or study. The problems faced in studying the demand side of this industry are somewhat analogous to those of studying computer use, except that there is even less hard Canadian data available in this case.

## 3. BASIS FOR QUANTITATIVE ANALYSIS

The first task related to any attempt at quantitative analysis must be to determine what data and statistics are available in this area, and their relevance to the proposed study. The following possible sources, which collect and disseminate a variety of EDP statistics on an annual or ongoing basis, were examined:

1. Statistics Canada
   The Computer Services Industry Report (Cat. 63-222, 1972-79);
2. Treasury Board
   Review of EDP and Telecommunications in the Government of Canada (Annual Reports);
3. Canadian Information Processing Society (CIPS)
   Canadian Computer Census (Annual publications, 1965-1980);
4. Evans Research Corporation of Canada
   EDP In-Depth Reports (Jan. 1979 - Oct. 1981 issues);
5. American Association of Data Processing Service Organizations (ADAPSO)
   1978 Annual Report;
6. Canadian Association of Data Processing Service Organizations (CADAPSO)
   Annual Surveys of Member Firms

The October 1981 (Vol. 11 No.2) issue of Evans' EDP In-Depth Reports is devoted to Public Databases. With the exception of this issue, however, examination of the data provided by the above publications showed that there was virtually no separate statistical coverage of information retrieval activities, although some attention has been given to the problems of developing, maintaining and using online management information systems (MIS). It was therefore concluded that, with the exception cited above, none of the above sources, either individually or in aggregate, could provide the data necessary for an adequate quantitative evaluation of public information services in the Canadian or North American context.

However, several organizations now maintain and publish directories covering the products and services available in this area. The following four directories were consulted and the information provided analyzed.

### 3.1 Encyclopedia of Information Systems and Services

This Encyclopedia, edited by Kruzas and Schmittroth, is now in its 4th edition (1981). It provides comprehensive coverage of information products and their producers. More than 2030 organizations are described in this edition. The main inventory is arranged by parent organization name in alphabetical sequence. There are 22 indices which provide a detailed analysis of the contents of the Encyclopedia and the fields covered, 14 indices classify listed organizations by general type of activity or function (Database Producers, Data Collection and Analysis, Online Vendors/Telecommunications Networks, Abstracting and Indexing Services, etc.), and 8 indices provide access to entries through such specifics as database name, subject interests and geographical location.

Within the limitations of availability and appropriateness, the following items of information are given for each organization:

1. Name, Address and Telephone Number
2. Founding Date
3. Head of Unit
4. Staff
5. Related Organizations
6. Description of System or Service
7. Scope and/or Subject Matter
8. Input Sources
9. Holdings and Storage Media
10. Publications
11. Microform Products and Services
12. Computer-based Products and Services
13. Other Services
14. Clientele/Availability

15. Projected Publications and Services
16. Remarks and Addenda
17. Contact

## 3.2 Computer-Readable Databases: A Directory and Data Source Book

This directory, edited by Martha Williams et al., was published by the American Society for Information Science in 1979, updating the earlier publication of 1976. It was produced from data maintained in the "Database of Databases" by the Information Retrieval Research Laboratory (IRRL) at the University of Illinois at Urbana. All the 528 databases included in this directory fulfil three criteria:

i) they are in computer-readable form;
ii) they are publicly available; and
iii) they are used for information retrieval purposes, or are available through the major online vendors of information retrieval services.

The main inventory consists of a detailed description of each of the 528 databases, arranged in alphabetical sequence according to IRRL record name. It is supplemented by 4 indices, which are ordered by database producer name, processor (i.e. vendor) name, database name and subject matter.

For each specific database, the information available is grouped under eight major headings, as follows:

1. Basic Information
2. Producer/Distributor/Generator Information
3. Availability and Charges for Acquisition of Database Tapes
4. Subject Matter and Scope of Data in Database
5. Subject Analysis/Indexing Data
6. Data Elements Present
7. Database Services Offerred
8. User Aids Available

### 3.3 Cuadra Directory of Online Databases

This directory, published quarterly by Cuadra Associates Inc., is compiled and edited by Cuadra, Abels and Wanger. The present edition, Volume 3 Number 1, was published in the fall of 1981. The criteria applied in selecting a database for inclusion in the directory are as follows:

i) it must be available online;

ii) it must be available to the public, or to organizations that can establish their eligibility through subscriptions or membership;

iii) it must be accessible through an online service organization that is connected to one or more international telecommunications networks, and/or to networks that serve one country, or a limited set of countries.

The 1981 main inventory, arranged in alphabetical sequence by database name, consists of 760 entries covering approximately 965 databases and distinctly named files within database families; this number represents a 57% increase in over the number of entries in Volume 2, Number 1, published in the fall of 1980. Four indices are provided, ordered by subject matter, producer name, online service name and database name. Addresses and telephone numbers are provided for the 512 producers and 170 online services listed. The number of online services listed in the directory has increased in 12 months by 83%, from 93 in Volume 2, Number 1 through 135 in Volume 2, Number 3, to 170 in Volume 3, Number 1. The growth in the number of entries and online services primarily reflects an increase in new products/ services, but expanded scope and coverage of the directory has also added to the number of online services. The Cuadra Directory has been used as the basic source of information for the tables in Appendices A and D.

The information for each database is provided under the following set of headings:

1. Name of Database
2. Type (2 level classification)
3. Subject

4. Producer
5. Online Service
6. Conditions for access
7. Content
8. Coverage
9. Updating

### 3.4 COIN: A Directory of Computerized Information in Canada

This directory, now in its second edition, provides extensive coverage of public online databases currently being accessed by Canadians. Edited by Sandra West, COIN is published by the Alberta Information Retrieval Association. It is also available for online searching on the SPIRES system at the University of Alberta in Edmonton. A database must satisfy three criteria to be included in the directory. It must be:

i) publicly available in Canada;
ii) in machine readable form; and,
iii) contain statistical or bibliographic information.

Because of the restriction regarding public availability in Canada, the coverage of COIN is less than that provided by Williams or Cuadra.

The main inventory consists of a detailed description of about 350 databases, arranged in alphabetical sequence by database name. Unlike Williams and Cuadra a separate entry is given for each host system at which the database is available. Thus ABI/INFORM, which is available through BRS, Infomart (SDC) and DIALOG, generates 3 entries. The main directory is supplemented by a Keyword Index providing subject reference to the databases, and a Contact Index providing more detailed information about each search centre.

The following information is provided for each database entry:

1. File Name - Including database name, acronym and host system (vendor)

| | | |
|---|---|---|
| 2. | Type | - Statistical or Bibliographic |
| 3. | Source | - Database Producer |
| 4. | Contact | - List of Contact Organizations in Canada |
| 5. | Abstract | - Explains the subject coverage |
| 6. | Data Types | - Description of data elements |
| 7. | File Size | - Total number of records, as of a given date |
| 8. | Updating | - Update frequency and number of records added per update |
| 9. | Time Span | - Time period covered |
| 10. | Location | - Address of host system |
| 11. | Storage | - Computer storage medium, usually disc |
| 12. | Machine | - Model and size of the host computer |
| 13. | Restrictions | - Availability of the database to the public |
| 14. | Cost | - Database charges as designated by the host system |
| 15. | Searchable | - Online or Offline |

Note that items 10 to 15 can vary from one host system to another. A detailed analysis of the information in the COIN Directory is provided in a companion report (see Appendix I).

The above directories give a considerable amount of information regarding the supply side of the public information services industry. What is lacking, however, are statistics related to usage volumes and revenues; therefore, the directories cannot be used to construct a picture of the demand side. Industry studies, if available, must be used to fill this gap in the information.

The next step was to look for industry studies of the Online Database Services markets. Four such studies, by International Resources Development (IRD) Inc., Creative Strategies International (CSI), Link Resources, and Input Ltd., all published in 1980-81, were identified. The first three studies deal with the U.S. market and the fourth with opportunities in the European market. With the exception of the Evans report cited earlier, no similar studies have been identified as yet which attempt to deal with the Canadian market. The IRD study was acquired. The Link study cannot be acquired on an individual basis

and a subscription to the Online Database Planning Service ($15,000 annually) was not considered as cost justifiable for the purpose of this phase of the project. However, access to the main results of the study was obtained through the National Library and the Telidon project. Summary results from the LINK, CSI and Input studies have been published in the EDP Weekly.

Faced with this situation, it was decided that the most appropriate course of action would be as follows: a review of the size and growth trends of the U.S. market would be made using the industry studies available and any other relevant published material; a "scale and lag" process, supplemented by whatever quantitative information could be collected from Canadian information producers and database vendors, would then be used to derive order-of-magnitude estimates of the current Canadian market for public information services; and in attempting to project the Canadian market to 1985 and 1990, U.S. growth trends would be modified, where judged necessary, to take into account the impact of purely Canadian factors.

# 4. CLASSIFICATION OF ONLINE DATABASES AND THEIR CHARACTERISTICS

There are a number of ways in which one can classify databases. Databases vary by subject, scope, type of information, geographic and chronological coverage, frequency of updating and also by record/file structures, types of systems with which they can be used, intended uses and intended users. The classification scheme used in this report was proposed by Wanger and Landau. It is also used for the Cuadra Directory of Online Databases.

The Cuadra Associates classification scheme is a two-level one, based upon the type of information contained in a database. The primary distinction is made between (1) Reference databases (i.e. those that refer users to a primary source for complete information), and (2) Source databases (i.e. those that themselves contain the source or primary information). Within each of the two primary types, there is a secondary classification, as shown below.

## 4.1 Classification Scheme

### 4.1.1 Reference Databases

These databases refer or "point" users to another source (e.g. a document or an organization) for additional information or the complete text of a citation or abstract. All Reference databases are textual in nature. They are further sub-divided into:

#### 4.1.1.1 Bibliographic

These databases contain citations and, sometimes abstracts of the printed literature, e.g. journal articles, reports, books, newspaper items, conference proceedings, dissertations. Most of the databases offerred by the search services (Dialog, SDC, BRS, CAN/OLE) fall into this category.

#### 4.1.1.2 Referral

These contain references and, sometimes, abstracts or summaries of non-published information. They generally refer users to organizations, individuals, audio-visual materials and other non-print media for further information.

### 4.1.2 Source Databases

These databases contain complete data or the full text of the original source information. They can be alphanumeric or textual in nature. Source databases are further sub-divided into 4 categories, as shown below:

#### 4.1.2.1 Numeric

These databases contain original census or survey type data and/or statistically manipulated representations of data. The data are often in the form of time series. The database can also contain headings, titles and explanatory notes. The best known Canadian example is CANSIM (Canadian Socio-Economic Information Management System).

#### 4.1.2.2 Textual-Numeric (or Alphanumeric)

These databases consist of records that contain a number of data elements or fields with a combination of textual information and numeric data. Census or survey data are often in this form.

#### 4.1.2.3 Properties

Such databases contain dictionary or handbook type data, typically chemical and physical properties.

#### 4.1.2.4 Full-Text

These databases contain records of the complete text of some primary source, such as a newspaper item, a specification or a court decision. Such databases are becoming particularly important in the fields of legal research/documentation and news/information services.

## 4.2 Record Structures and Database Management Systems

Reference databases of both types are typically sequential files, with records that contain a number of descriptive elements. Both types are easily handled by today's information retrieval systems. Database management capabilities need further upgrading to handle dynamic file updating and modification, but generally available retrieval and display capabilities are adequate and well suited to the majority of intended users of such databases. Although users such as reference librarians can be expected to have received some training in the use of a particular vendor's system/package, ease of use remains an important consideration.

The file and record structures of source databases are much more varied than those of reference databases. Many numeric databases consist of large numbers of time series, which are retrieved singly or in groups, and over a specified time horizon. On the other hand, full text databases and some of the textual-numeric databases may be more like bibliographic databases in record and file structures.

One can therefore see the requirement for three types of database management and retrieval system, each optimized for its particular role: systems for handling bibliographic databases; systems for handling numeric databases, especially those containing time series, which require special manipulation; and systems for handling full-text databases, which require a full-text, free-text search capability. Each may be offered by a different type of vendor, and there may or may not be economies of scope for the vendor attempting to offer two or more different systems.

## 4.3 Database Producers

For purposes of analysis, database producers can be divided into two broad categories: those who produce reference databases and those who produce source databases.

In many cases, reference database producers are primarily publishers of printed index and abstract journals such as Chemical Abstracts. These organizations, which can be in either the private or public sector, acquire, screen, select, index and often abstract or summarize the primary literature. To produce printed publications efficiently, these organizations have adopted computerized systems for photocomposition and phototypesetting. This operation generates magnetic tapes that can be reformatted and used as direct inputs to computerized storage and retrieval systems.

Source databases, on the other hand, are produced by a number of different types of organizations. Some are government agencies that have a responsibility for the dissemination of the information collected or generated in their particular area; examples would include Statistics Canada and the U.S. Bureau of Labour Statistics for source numeric databases. Some producers are also publishers of printed reports, books, journals and newspapers, who have turned to electronic publishing to protect their revenues or increase their market share; examples would include newspapers (Globe and Mail, New York Times) and legal publishing firms (QL Systems Ltd. and West Publishing Co.) for source full text databases. Some producers process and package data that were collected by some other source, often a government agency. In their packaging, these producers frequently bring together data from a number of sources, and sometimes increase the value of a collection by including additional derived data, such as summary totals, forecasts, etc. that they generate from the source data.

Most producers make their databases available to database distributors or vendors, under a variety of contractual arrangements. Some, however, ditribute their own databases. Such organizations, who combine the database

production and distribution functions, are sometimes referred to as integrated services. They are described further in the next section.

## 4.4 Database Vendors

Database vendors can be classified into three groups: Remote Computing Services (RCS), Search Services and Integrated Services. Each group has special characteristics, which are described below. Appendix A gives a list of the database vendor firms who have their headquarters in Canada.

### 4.4.1 Remote Computing Services (RCS)

Timesharing service bureaus or remote computing services, sometimes referred to as "network information services", form the numerically largest category of database vendors. These firms provide a wide variety of data processing related service, including computing power, application and custom software development, EDP consultancy and educational services. Public and private-line telecommunications networks are used to deliver computing power as well as information to many users simultaneously, at locations remote from the central computer site. A companion report of the Task Force has studied the Canadian commercial service bureau industry.

As a byproduct of providing interactive computing power, more than 80 RCSs also distribute online databases. This activity is either based on a deliberate marketing strategy, or is in response to customer requests; it generally remains a secondary activity and source of revenue. RCSs usually distribute source numeric or alphanumeric databases, where the data is often manipulated or post-processed by the user after retrieval, thus generating further revenues based on computer usage. Appendix D shows that 62 out of the 66 database distributed by I.P. Sharp Associates and all 57 of the databases distributed by DRI are source numeric in format. In such cases it is difficult, if not impossible to separate the revenues attributable to information retrieval from those related to post-processing of the retrieved data.

### 4.4.2 Search Services

The term "search services" is usually applied to vendors of reference/bibliographic databases. It refers specifically to their software programs and the types of user-computer interactions that they make possible.

The largest bibliographic search services in North America are Dialog Information Systems, Systems Development Corporation (SDC), Bibliographic Retrieval Services Inc. (BRS), the National Library of Medicine (NLM) and the Canada Institute for Scientific and Technical Information (CISTI). These services differ from other online vendors in that they have traditionally concentrated on distributing large numbers of reference/bibliographic databases. This emphasis may, however, be changing due to technological developments. The search services are refining their software to allow access to and manipulation of alphanumeric databases. IRD predicts that by 1985 the three major U.S. search services in the private sector, Dialog, SDC and BRS, will transform themselves into full-fledged "all-purpose" distributors of the differing types of databases: reference/bibliographic, source/alphanumeric and source/full text.

### 4.4.3 Integrated Services

Organizations that both produce and distribute online databases are referred to as "integrated services". This category overlaps, to some extent, with the RCSs, the difference being more one of emphasis. With RCSs, databases usually play a supporting role to the timesharing function; by contrast, for integrated services both the databases and the distribution system play equally important roles.

By the above definition, both I.P. Sharp Associates and DRI should, perhaps, be classified as integrated services. Both firms produce a significant number of the databases which they distribute. Many "electronic publishers" provide integrated services. They include InfoGlobe, Dow Jones News/Retrieval, Mead Data Central's LEXIS and NEXIS Services and the New York Times Information Service. There has been a tendency for "electronic publishers" to acquire established RCSs, and use them to disseminate a wide variety of databases. The best examples are McGraw-Hill's acquisition of DRI (and its integration into the McGraw-Hill Information Services Company), and the acquisition of The Source by Reader's Digest.

## 5. MARKET STRUCTURE AND CHARACTERISTICS

In some respects, the market for public online information retrieval services is a worldwide one. It is not homogeneous, however, and it can be segmented into sub-markets, both geographically and by the type of online databases offered. No sub-market, either geographical or functional, is monopolized by a single company. Each sub-market does, however, have a few dominant firms. Barriers to entry exist in both database production and distribution and both functions seem to be characterized by at least some economies of scale and scope.

### 5.1 Total Market Size and Geographical Segmentation

Although there are no hard statistics, the world market for information retrieval and anciliary services was valued at U.S. $2 billion in 1979 (Ref. A15). An Input study (Ref. C5) gives a value of U.S. $1.17 billion for the domestic U.S. online database services market in 1979, and a value of $150 million for the corresponding European market. To see this market in perspective, it may be mentioned that $2 billion in 1979 was just over 1% of the world electronics market and under 5% of the computer market. Compared to the $12.5 billion turnover of the U.S. publishing industry in 1979, the online database service market of $1.17 billion was only some 9.4%.

It should be stressed, however, that the market for business information in electronic form, delivered from online databases, is growing much more rapidly than the publishing industry, or the computer market as a whole. A recent Knowledge Industry Publication report, titled "The Business Information Market 1982-87" (Ref. C6), projects growth of the total business information market to between $17.4 billion and $22.5 billion in revenues by 1987 (mean value $19.5 billion). Online databases are predicted to have the fastest growth of any form of business information over the next five years, increasing from some 6% of the total in 1981 to some 18%, or over $3.5 billion in 1987. The same report estimates that total business expenditures for external professional and information services amounted to $115 billion in 1980. This figure is projected to increase by 132% to $268 billion in 1987.

Because of the supporting telecommunications infrastructure and institutional factors, it is both possible and convenient to segment the worldwide market into geographically distinct sub-markets such as North America (the U.S. and Canada), Europe (the EEC countries) and the Far East (Japan, Australia, Hong Kong, Singapore, etc.). The North American sub-market is served by an integrated, packet-switched data communications network which is steadily becoming universal in scope. A similar development may occur in the European sub-market by 1985. Although public and private telecommunications networks (such as Telenet, Tymnet and the Sharp APL Network) link these three sub-markets, a database vendor with computer facilities located in North America is still faced with substantial telecommunications costs and non-tariff barriers in serving users located in the other two sub-markets and vice versa.

On the demand side, U.S. domestic demand is predominant and currently accounts for at least 80% of the total demand. Canadian demand is some 5% of U.S. demand, and European demand only some 15%. The European share is surprisingly low, given the fact that the total Gross National Product (GNP) of the EEC countries is higher than that of the U.S. Online database services made a slow start in Europe, and demand for such services is only now taking off. It must be noted, however, that in Europe a concerted government-supported effort is underway to create/support an indigenous information retrieval industry.

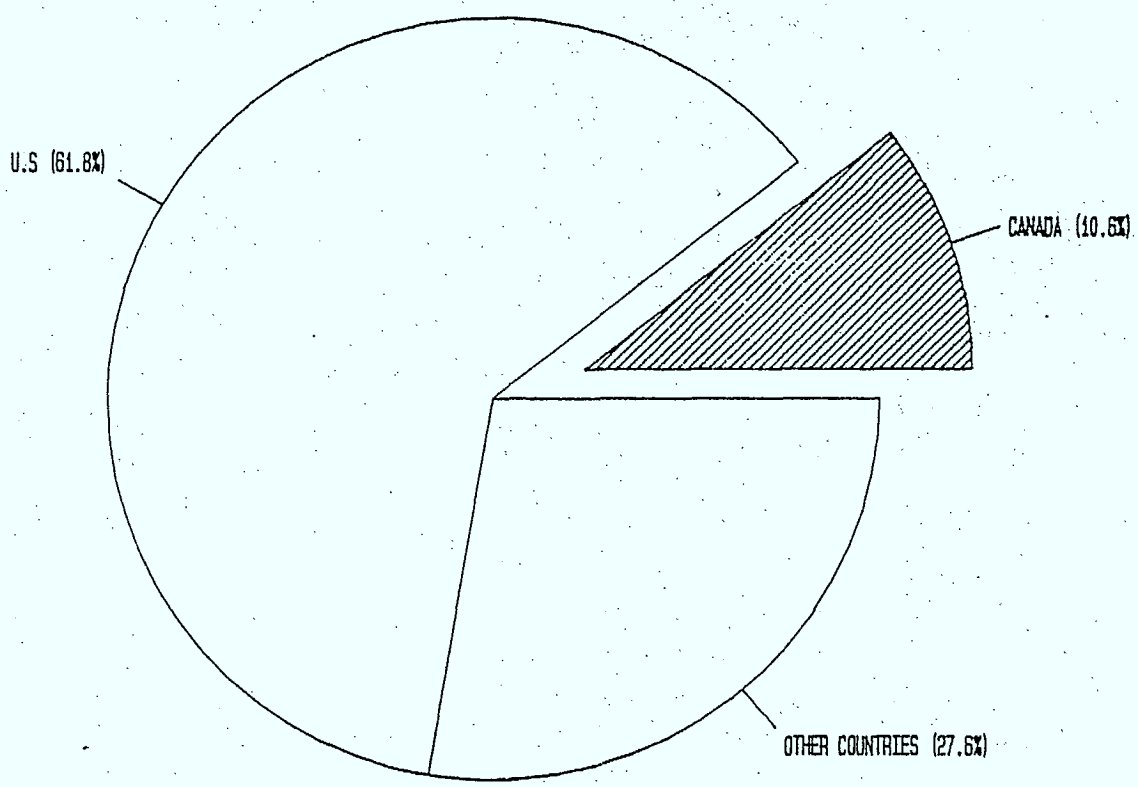
Supply side information regarding database producers and vendors, as well as the number of databases and the volume of information they contain, is given in Tables 5.1 and 5.2. Table 5.1 shows that of the 512 database producers listed in the Cuadra directory, only 61% are U.S., while 10% are Canadian and 25% belong to other countries. Table 5.2, which deals primarily with reference and textual databases, shows that while 59% of such databases were produced in the U.S. in 1975, 51% were produced outside the U.S. in 1979. The U.S. databases accounted for 88.5% of the total volume of records in 1975, and 63.2% in 1979. It should be noted, however, that a very large proportion of the non-U.S. database producers are government agencies or non-profit organizations.

Information regarding database vendors is given in Table 5.1 and Appendix A. Of the 170 vendors listed in the Cuadra Directory, 62% were headquartered in the U.S., 11% in Canada and 27% in other countries. It should be noted, however, that while most vendors only serve their own national or

GRAPH 5.1

# GEOGRAPHICAL DISTRIBUTION OF DATABASE VENDORS*

(OUT OF TOTAL OF 170 VENDORS)

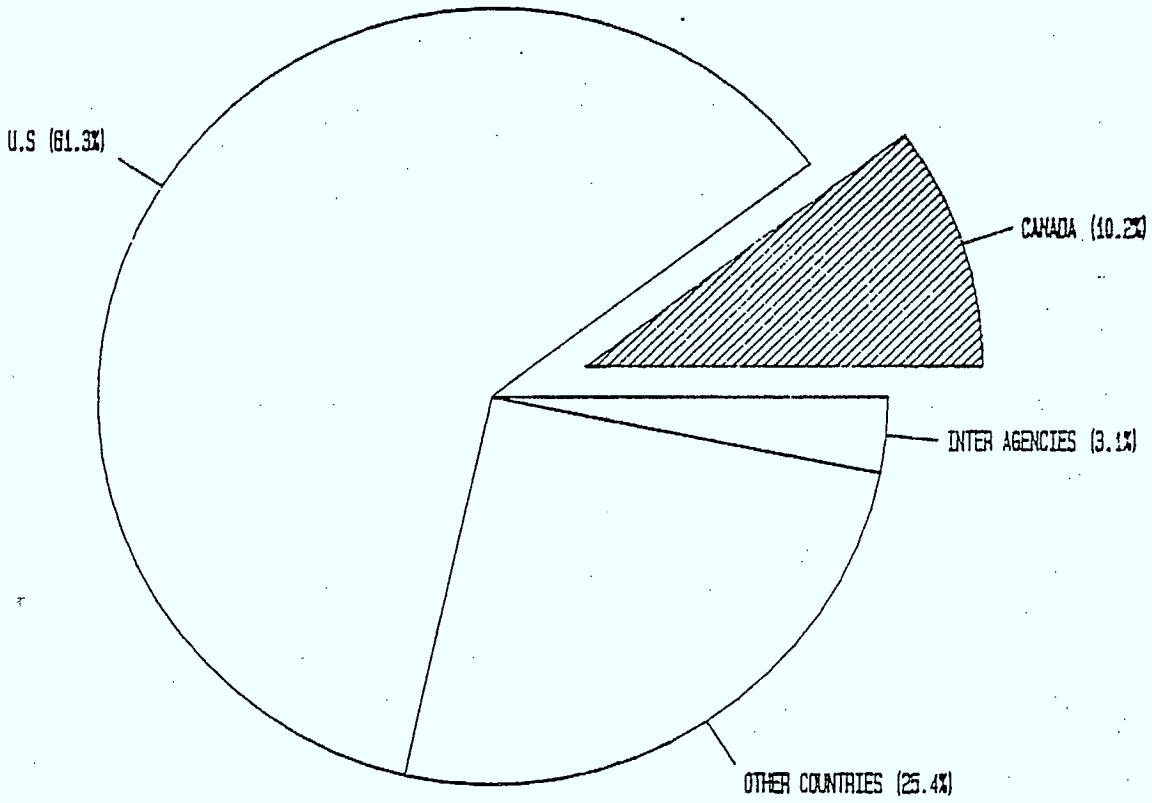



*DIRECTORY OF ONLINE DATABASES, CUADRA ASSOCIATES, VOL. 3, NO. 1, PUBLISHED FALL 1981.

GRAPH 5.2

# GEOGRAPHICAL DISTRIBUTION OF DATABASES*

(OUT OF TOTAL OF 512 ONLINE DATABASES)




* DIRECTORY OF ONLINE DATABASES, CUADRA ASSOCIATES, VOL. 3, NO. 1, PUBLISHED FALL 1981.

Table 5.1: Geographical Distribution of Database Producers and Vendors

| Area | Database Vendors | | Database Producers | |
|---|---|---|---|---|
| | Number | % Total | Number | % Total |
| United States | 105 | 61.8 | 314 | 61.3 |
| Canada | 18 | 10.6 | 52 | 10.2 |
| Other Countries | 47 | 27.6 | 130 | 25.4 |
| International Agencies (UN, OECD, EEC) | - | | 16 | 3.1 |
| Total | 170 | | 512 | |

Source: "Directory of Online Databases", Cuadra Associates, Vol. 3, No. 1, published Fall 1981.

Table 5.2: Geographical Distribution of Reference and Natural Language Databases and Database Records 1975-1979

| Area | Item | Year | | | | | | % Increase | |
|---|---|---|---|---|---|---|---|---|---|
| | | 1975 | | 1977 | | 1979 | | 1979 | 1975 |
| | | No. of Databases | No. of Records (m) | No. of Databases | No. of Records (m) | No. of Databases | No. of Records (m) | | |
| United States | Data-bases | 177 | | 208 | | 259 | | 46.3 | |
| | % Total | (58.8) | | (57.5) | | (49.1) | | | |
| | Records (m) | | 46 | | 58 | | 93.5 | 103.3 | |
| | % Total | | (88.5) | | (81.7) | | (63.2) | | |
| Non U.S. | Data-bases | 124 | | 154 | | 269 | | 116.9 | |
| | % Total | (41.2) | | (42.5) | | (50.9) | | | |
| | Records (m) | | 6 | | 13 | | 54.5 | 808.3 | |
| | % Total | | (11.5) | | (18.3) | | (36.8) | | |
| Total | Data-bases | 301 | | 362 | | 528 | | 75.4 | |
| | Records (m) | | 52 | | 71 | | 148 | 184.6 | |

Source: Williams, M.E. "Databases and Online Statistics for 1979" (Ref. B14).

regional sub-market, the major private North American vendors (all U.S. except for I.P. Sharp Associates Ltd.) also serve the European and Far Eastern sub-markets, either directly through subsidiaries or by joint ventures with local firms. There are virtually no corresponding examples of European vendors serving the North American sub-market. Many of the major U.S. vendors are also the dominant firms in their product sub-market. It is, therefore, quite possible that the U.S. share of total vendor revenues may be as much as 85-90%, rather than the 62% share indicated by the mere number of vendors.

## 5.2 Market Segmentation by Product Lines

Based on product differentiation, the market for public online information retrieval services can be segmented into three broad sub-markets. These will be classified as the Reference database, Source Alphanumeric (i.e. numeric and textual-numeric) database and Source Full Text database sub-markets. Table 5.3 gives the number of databases in each area, broken down further by four major disciplines.

Reference databases are used primarily by reference librarians, information specialists and research workers. Although accounting for some 40% of the total number of databases, they produce only some 10% of the vendor revenues. Less than 10% of such databases relate to Business and Economics, while over 50% relate to Science and Technology and some 20-25% are Multidisciplinary. As indicated in Section 4, the dominant vendors in this sub-market are the major U.S. search services, especially Dialog, SDC, BRS, OCLC Inc. and the National Library of Medicine.

Source alphanumeric databases are heavily used by business firms and other organizations to aid managerial decision making and corporate planning. They can be further sub-divided into Financial, Socio-Economic, Demographic, Credit and Marketing databases. This sub-market contains some 50-55% of the total number of databases, but accounts for some 70-80% of total vendor revenues. Over 90% of these databases are related to Business and Economics. This sub-market is growing more rapidly than the Reference database one.

The Source Full Text sub-market may be sub-divided further into Legal and News databases. Although vendor revenues are currently small, some 5-10% of the total, they are growing rapidly. If the price/performance of news database

Table 5.3: Analysis of Databases by Discipline and Type

| Major Discipline | Reference Databases | | | Source Database | | | | |
|---|---|---|---|---|---|---|---|---|
| | Biblio-graphic | Referral | Total | Numeric | Textual-Numeric | Properties | Full Text | Total |
| Business and Economics | 12 (9.9%) | 1 | 13 (8.8%) (6.2%) | 179 (93.2%) | 11 (91.7%) | - | 5 | 195 (93.8%) |
| Science and Technology | 72 (59.5%) | 7 | 79 (53.7%) (85.9%) | 3 (1.6%) | 1 | 9 | - | 13 (14.1%) |
| Social Sciences and Humanities | 19 (15.7%) | 2 | 21 (14.3%) (67.7%) | 10 (5.2%) | - | - | - | 10 (33.3%) |
| Multidisciplinary | 18 (14.9%) | 16 | 34 (23.1%) (73.9%) | - | - | - | 12 | 12 (26.1%) |
| Total | 121 (82.3%) | 26 (17.7%) | 147 (39%) | 192 (83.5%) | 12 (5.2%) | 9 (3.9%) | 17 (7.4%) | 230 (61%) |

Source: "Directory of Online Databases", Cuadra Associates, Vol. 3, No. 1, published Fall 1981.

services is sufficiently improved over the next 5-10 years by technological developments, a mass consumer demand may develop, with millions of subscribers rather than a few thousand information specialists and researchers. The other distinct possibility is a merger of the Reference and Source Full Text sub-markets, due to the possibility of storing the full text of a paper or article or even a book with its citation, rather than just a summary or abstract. The major search services can be expected to lead this development.

### 5.3 Barriers to Entry

Although the provision of and access to telecommunications facilities/services is heavily regulated in most countries, the public online information retrieval services industry is not. Its industrial structure shows much less concentration than is found in telecommunications services or mainframe computer manufacture; there is no AT&T or IBM in the industry. However, three kinds of barriers to entry do exist:

i) Investment and Capital requirements;
ii) Access to relevant data; and,
iii) Economies of scale (and scope).

#### 5.3.1 Investment and Capital Requirements

Although definitive information is not available, it seems clear that entering the online information retrieval services market require substantial initial investments relative to the revenues likely to be achieved in the first 3-5 years. For example, the New York Times invested about $10m in 1973 to put its INFOBANK news database online; Mead Corporation's initial investment in its LEXIS legal database, which opened for service in 1973, was $20m; TRW's investment was of the order of $70m.

These investments are required to acquire a host computer and its operational/programming support staff, set up a telecommunications network, acquire or develop the necessary database management software, acquire a set of databases and convert them into the form required by the management/retrieval software and then load them online so that they can be accessed by end users who have been educated/trained to use the service. It may take the new entrant 2-3 years to accomplish the above process. A further period of time must elapse

before the break even point is reached and a customer service training base developed when revenues cover operating costs.

Acquisition of an existing company (database vendor or timesharing computer service bureau) is, of course, an alternative form of entry investment. Thus McGraw-Hill acquired DRI for $103m. Similarly, Dun and Bradstreet acquired National CSS Inc., and Reader's Digest acquired Source Telecomputing Corporation.

For the database producer, there is a major difference between the investment necessary to set up a data collection mechanism and that necessary to put an existing machine-readable database online. An information system can be very expensive to set up. Producers questioned by LINK estimated that the investment needed to start from scratch could range from $2m to $10m. This is why many information producers are government agencies who have a mandate to create, collect or otherwise provide data; or print publishers who use computerized techniques to create input data for hard copy publications. Once the costs of information provision have been absorbed, information production becomes a marginal cost.

### 5.3.2 Lack of Access to Data

In addition to requiring large investments, access to relevant data for the purpose of producing an online database, producers of databases may be faced with other obstacles. The contractual permission of the creators/originators of the data is required if the data is not in the public domain. This permission may be witheld by authors and/or publishers for both economic and non-economic reasons. The definition of the property/economic rights of the information provider is still confused, to say the least. Agreements such as the Berne Convention and the Universal Copyright Convention have been made somewhat obsolete by the new information technologies. These legal/institutional issues are discussed further in Section 15.

### 5.3.3 Economies of Scale and Scope

As shown in section 5.3.1, database distribution involves substantial overhead fixed costs. On the other hand, the reproduction cost of a given item of information, excluding the physical medium, is virtually nil. Therefore, in

an information retrieval system, the reproduction cost of an item should approach the marginal cost of accessing and retrieving it. Such a situation should give rise to important economies of scale.

One would also expect an inherent economy of scope between database distribution and the traditional activities of computer timesharing service bureaus. The computer facilities, support staff, telecommunications networks, user training and support are required for service bureau operations. The additional costs involved in database distribution are related to acquisition of databases and appropriate software, extra online storage, loading and updating the databases regularly and marketing/training costs. Source numeric databases present an additional attraction, because the information retrieved is usually manipulated or post-processed by the user, thus resulting in additional computer usage revenues. These characteristics are well demonstrated by the operations of I.P. Sharp Associates and DRI.

There could be further economies of scope between the activities of information providers and producers, and also between database production and distribution.

## 6. TECHNOLOGICAL TRENDS

A technology trends report has been prepared as a background document for the Task Force. This report provides a general overview of the major areas and advances in computer technology and capability, emphasizing the present environment and changes envisaged over the next five years. The term computer technology is defined in the report to include hardware, software and telecommunications aspects of computing.

In this section, we shall limit ourselves to looking at trends in computer-communications technology which are relevant to the provision of public online information services. Before this is done, however, we will review developments made through 1955-80 and trace the evolution from batch searching to online search services provided to an unrestricted number of users, by information utilities operating on a national or multinational scale.

### 6.1 Historical Evolution of Online Information Services

The feasibility of applying a computer to bibliographic searching was first demonstrated in 1954. This was followed by research and development efforts which, over the next ten years, led to a number of special libraries offering regular batch search services. In 1964, the U.S. National Library of Medicine (NLM) started a batch search service using its Medical Literature Analysis and Retrieval System (MEDLARS). This was the first large-scale, computer-based, retrospective search service to become available to the general public. Batch searching was a useful advance over manual searching for a number of questions, but its shortcomings precluded widespread application. The

average NLM in-house turnaround time was about two weeks, and the access retrieval timespan for the user was about six weeks. Online searching therefore developed as a viable alternative, being made technically feasible by the integration of computing technology with telecommunications networks.

Online systems began in a batch searching context and proceeded to evolve in three phases, as follows:

i) Feasibility Studies and Demonstrations

This phase lasted from 1960, when Systems Development Corporation (SDC) made the first public demonstration of online bibliographic searching, to about 1967. By the latter date SDC, Lockheed/Dialog, Stanford University, MIT and IBM had all developed and demonstrated online systems. SDC, supported by the Advanced Research Projects Agency (ARPA), had carried out an experiment in 1965 to demonstrate an online retrieval network on a national scale.

ii) Production Services with Restricted User Populations

This phase lasted from about 1967 to 1971. The first efforts beyond the demonstration stage to regular production search services were made in 1967 by Lockheed. Regular online search services were provided to the NASA Ames Laboratory using the DIALOG System and a file of 260,000 citations. This was followed by other Lockheed services, SDC's first ORBIT-based services, online searching of NLM's MEDLARS databases using the IBM/STAIRS and AIM/TWX retrieval systems, and Stanford University's

University's SPIRES system. In each case, the number of users was limited, varying from 6 to 32, and access was via the public switched telephone network, or private leased lines. The number of users was also limited by the fact that at that time only a restricted number of interactive terminals could be supported by a computer at any one time.

A similar time frame witnessed the start and growth of computer service bureaus offering a variety of remote computing services, ranging from remote batch, through conversational remote batch to interactive time sharing services. Two companies in particular, I.P. Sharp Associates Ltd. and General Electric Information Services Company (GEISCO) adopted the strategy of providing interactive services to an international market right from the beginning. The use of key driven terminals, especially CRTs, as input-output devices also began to increase. Some of the service bureaus began to offer numeric data bases to their clients either as a result of specific user demands or as a natural extension of their service offerings.

iii) National or Multinational Information Utilities

The decade 1971-81 has witnessed a steady maturing, followed by a rapid growth of public online information retrieval services. From serving limited constituencies, they became available to an ever widening audience, then to anyone in North America who wanted to use the services, and finally (at least in theory) to anyone in the world.

The Lockheed DIALOG system opened its service to interested organizations in 1971-72 and began to expand its databases. Today it offers access to some 170 databases and serves over 20,000 users in 40 countries. The GEISCO service provides local calling access to its telecommunications network in at least some 700 cities in 25 countries. I.P. Sharp provides similar local calling access to its Sharp APL Network in some 400 cities in North America, Europe, Asia and Australia.

The removal of high long-distance calling charges completely altered the economics of using public information services. The key breakthrough in the 1970's, which enabled these database vendors to reach large audiences, was in the implementation of telecommunications networks designed specifically for data transmission; this has greatly improved the reliability, as well as the price/performance of the telecommunications links, i.e. distance insensitive rates. Both digital data networks like Dataroute, and packet switched networks like Tymnet, Telenet, Datapac and I.P. Sharp's private network, have played an important role. Today all major vendors in the U.S. can be accessed via the U.S. international value added networks Tymnet and/or Telenet, and all major ones in Canada via Datapac. Furthermore, because of gateways between Telenet and Tymnet on the one hand, and Datapac on the other, the whole of North America is, for practical purposes, served by an integrated packet switched network. The private Sharp APL Network also provides gateways to these three packet switched networks, as well as to the Telex network. Progress in providing access from the North American packet switched networks to the European ones has been slower. Many links from North America to Europe still use leased private

circuits. The North American vendor providing online services in Europe is still faced with large telecommunications costs. Further current policies of Europe's Euronet DIANE network do not provide a hospitable climate for North American data base vendors as European PTTs do not look favourably upon privately leased lines.

## 6.2 Technological Trends in the 1980s

As stated earlier, the key technological components of public online information retrieval services are:

i) Powerful timesharing computers operating as nodes of a teleprocessing system which permit a large number of users to carry on simultaneous interactions with the system via remote terminals;

ii) Large amounts of low-cost, random access storage media for holding the databases online;

iii) Appropriate systems and applications software, capable of efficiently organizing large databases, flexible searching and retrieval, and having user-friendly interfaces;

iv) An extensive, low-cost and distance-insensitive data transmission network capable of linking a wide variety of terminals to the central computers of the vendors; and,

v) Sophisticated user terminals which provide input-output capabilities, a communications interface and, preferably, some local intelligence.

Significant price/performance improvements can be expected to continue for those components whose performance is directly enhanced by Very Large Scale Integration (VLSI) micro-electronics technology. This is particularly true of the large central computers and the user terminals. Some sources have claimed that the price/performance of core memory and processing power are increasing by 40% and 25% per annum. Although the most spectacular advances have been in the field of micro-computers, the large central mainframe computer has also benefited from these developments. User terminals, in addition to having higher transmission speeds (1200 baud and higher) and greater local intelligence, may also evolve into multifunction workstations. The use of such workstations, which would combine word processing and data processing functions with communications capabilities and stand alone use, is likely to become widespread by 1990. In some organizations, every professional worker and manager may be able to access a public online database from a desktop workstation.

Large amounts of random access storage capacity, provided principally by electro-mechanical disk drives, are required for major online systems. Online storage is needed for:

a) the basic operating system and search service programs;
b) storage of master files;
c) storage of inverted indices to the files, which may have two to three times the storage requirements of the files themselves; and,
d) storage of intermediate results from user searches.

As an example, consider the Lockheed DIALOG system, which provides access to some 170 online databases containing over 40 million citations. The computer configuration currently operates with over 150 disk drives. Approximately 20 billion characters of information, mostly inverted index files revised as a result of each update, must be written to disk each month merely to maintain the files.

From 1960 to 1980, the storage capacity of disk drives has improved by two orders of magnitude, while the cost of storing a million bytes of information has decreased by almost the same factor. The 300-600 Megabyte capacity disks are now in routine use and disks with a capacity exceeding 1 billion bytes (gigabyte) are on the horizon. The most striking innovation in disk drive technology in the 1970s was the IBM Winchester drive which led to major improvements in the price/performance of disks. It comes in 5¼in, 8in and 14in disk sizes. Storage Technology's STC 8650 drive, announced in 1978, can store 10 billion bytes of information on its 16 disks (625 megabytes per disk). The main question in the 1980's is whether this rate of progress can be maintained using electro-mechanical technology. Some sources maintain that the next big breakthrough in disk storage will be adaptation of optical video disks to data storage. If the problem of erasing and rewriting data on video disks can be solved, price/performance improvements of another two orders of magnitude might result.

Telecommunications costs declined steadily throughout the 1970s, at an average annual rate of some 10%. The big breakthroughs came with digital data networks, packet switched networks and satellite communications. It can be expected that progress in telecommunications technology in the 1980s will lead

to public switched broadband networks, both terrestrial and satellite based, and that packet switched networks will become universal in scope. The main question for the vendors and users of public online information retrieval services is whether the savings accruing from this technological progress will be passed on to them, in the form of improved price/performance, by the telecommunications carriers. Under regulatory regimes favouring monopoly supply, there is always the possibility that rates for data communications services may be kept artificially high, and the excess revenues used to subsidize other services.

The main uncertainty lies in the area of systems and applications software development. Improvements in hardware price/performance have not been matched by corresponding software improvements during the 1970s. Although reliability has increased, progress in improving the efficiency of organization, searching and retrieval techniques has been incremental. There may be a major breakthrough, however, in applications software for full text databases. The concept of the "database computer" also holds promise.

## C. THE ECONOMICS OF PUBLIC INFORMATION SYSTEMS

This report highlights the lack of hard data regarding the demand side (usage volumes and revenues) of this industry generally, and the Canadian marketplace in particular. In this section, we present some preliminary findings regarding the U.S., European and Canadian marketplaces for Public Online Information Retrieval Services, and attempt to identify the sub-markets in which trade in such services is likely. We have also examined the pricing structures adopted by vendors in different sub-markets, and attempted to identify trends.

The preliminary findings have been grouped into three broad areas: the U.S. marketplace, the European marketplace, the Canadian marketplace and likely areas of trade in Public Online Information Retrieval Services. Many of the present findings are tentative, and may have to be modified as further information becomes available. The observations regarding flows of, and trade in services should be considered as speculative, since they cannot as yet be backed up by quantitative data.

## 7. PRICING STRUCTURES AND TRENDS

Pricing policies for access to and use of online database services can be quite complex. There are a number of components to the prices and they can be combined in a number of different ways. There is also a basic difference in pricing practices between the vendors of numeric databases, and those of textual databases (Reference or Source Full Text). In the former case, post-processing of the information accessed is the rule, rather than the exception; the user wishes to display, manipulate or analyze the information accessed, or use it in conjunction with a forecasting model. Numeric database vendors, therefore make their money by charging for computer time used. Textual data, on the other hand, cannot be post-processed in the same way. Search services, therefore, tend to charge by connect time or search costs.

There are some general points which can be made about pricing and prices. First, many vendors (30% according to the Cuadra Directory) require some kind of subscription charge for providing access to their databases. These subscription charges range from less than a hundred to several thousand dollars annually. DRI, which pioneered this idea, charges $16,000 for its U.S. macro-economic service and $26,700 for its agriculture service. In some cases, the subscription fee entitles the user to a package which may include access to one or more databases, training on how to use the software, and a specified amount of consulting services. In other cases, the user may have several options, each consisting of a front-end subscription price and associated usage charges. Many vendors also give volume and commitment discounts on their standard schedule of usage charges. Such discounts are of particular importance

to large firms who expect to make heavy usage of a particular vendor's services. They serve to considerably reduce the marginal cost of using the service.

The two major pricing strategies, one used by the timesharing computer service bureaus for their numeric databases, and the other used by the rest of the vendors for textual databases, are discussed below. It must be remembered, however, that there are exceptions in each group.

## 7.1 Pricing by Timesharing Computer Service Bureaus

Most service bureaus impose a monthly minimum charge, ranging from $50-100, that is applied if the total usage charge for the given month does not reach the minimum level. The usage charges include at least the following components:

i) Connect Time

An hourly rate, ranging from $1.00 to $21.00, that is charged for the period during which the user is connected to the system. This figure may or may not include telecommunications costs. The use of a packet switched network (e.g. I.P. Sharp) may result in a very low connect cost combined with a cost for every packet transmitted. The connect rate may or may not vary with the transmission speed of the terminal being used. A 1200 baud terminal could be charged a higher rate than a 300 baud one.

ii) Computer Resource Units (CRUs)

A rate for actual usage of the system resources, which combines charges for use of the central processing unit (CPU), the amount of input/output performed between the core memory and secondary storage (online disks and tapes), and sometimes charges for the user's work area in the core memory. The charges for CRUs vary enormously from vendor to vendor. They cannot be compared across vendors because of variations in the processing power of different vendor computers, and because the formulae used to calculate a CRU varies from vendor to vendor.

iii) Online Storage Costs

Additional costs are incurred by the user if he elects to store a selected amount of data from a public database, together with his own data, in a private online file. These costs are usually quoted in terms of daily or monthly rates per "page" or megabyte (million characters) stored. Service bureaus often provide large commitment discounts to users who agree to buy a large amount of online storage over a fixed period of time, such as a year. Such plans serve to reduce the marginal cost of storage.

iv) Offline Printing

The service bureau charges for offline printing on a high speed line printer. The rates range from $2-$5 per thousand lines printed. For large volumes of output, this is usually a more economical alternative than retrieving and printing the output at a key driven terminal because it avoids additional connect costs.

The online database customer may or may not be using the service bureau's standard schedule of charges, which usually offers discounts of varying magnitudes for non-prime time processing. In particular, the Computer Resource Units charged for the use of a particular database may be greater than the standard rate charged for other data processing services. This difference can occur because a surcharge has been added to the standard rates (by an additive or multiplicative factor) to act as a royalty to the producer of the database, or because the database system being used is more demanding of system resources than the "normal" mix of jobs. Lastly, the vendor may choose to levy a subscription fee or surcharge as a form of value pricing for access to and/or use of a particular database. This practice is used extensively by DRI, as can be seen in Table D.2, Appendix D.

v) Downloading

The rapid proliferation of microcomputers has opened up a whole new market segment. Companies such as BRS, The Source and Compuserve have begun to offer special rates in off-use hours, e.g. after 6 p.m., and downloading in microcomputers. Other vendors, especially timesharing service bureaus, are viewing the microcomputer and its ability to "download", i.e. copy large sections of their data bases, with some alarm. If, under their present pricing scheme, the bulk of their revenues accrue from the post-processing of retrieved numeric data, the shifting of such post-processing to the users' microcomputers would have a major impact. Timesharing service bureau vendors may, as a consequence, have to rethink their pricing schemes.

## 7.2 Pricing by Search Services and Other Vendors

In most other cases, especially the use of reference bibliographic and source full text databases, costs are based on the following elements:

i) Connect Time

An hourly rate, which may or may not include telecommunications costs for network access, and royalty charges. In many cases all three costs are bundled together into one flat hourly connect time rate. In others the royalty cost is stated separately or the telecommunications costs are made the direct responsibility of the user. The range of connect time rates varies from about $25 to $300 per hour ($5 - $10 on business hours). Business databases tend to have higher rates than those in the physical or social sciences. The Cuadra directory quotes an "average" rate of U.S. $65 per hour. Our preliminary review of the use of online information retrieval service in the federal government yields an "average" rate of Cdn. $70 per hour.

ii) Printing Costs

For bibliographic and some referral databases, there is an additional charge for offline printing by the vendor, which is generally based upon the number of citations or pages printed. This charge may range from a low of $.05 to a high of $5.00 per citation (the average is about $0.15). There may also be charges for online printing of the retrieved information at the user's terminal.

With the bibliographic databases, users can estimate costs across various online vendors by using the concept of a "search". Cuadra states that a search of a single database generally takes less than 15 minutes and may cost about $25 on the average. Averages, however, are just that. A simple search may require only 2-3 minutes, while a complicated one may take an hour. Lawton quotes "search" prices ranging from Cdn. $4 for health databases to Cdn. $43 for business databases.

One firm, QL Systems Limited, built its pricing strategy around the concept of the "search", rather than connect time but has now reconsidered this approach. It should be noted that there is no comparable "search" measurement for the use of numeric databases.

## 7.3 Other Considerations

It may be useful to note here the approach taken to royalties in the mass consumer market. For example, those designing video games (a digitized information product) do obtain royalty agreements giving them 1% of gross sales. Often the designers are given prominent credit in the video game, at times including the designer's picture.

# 8. THE U.S. MARKETPLACE

## 8.1 Overall Size and Growth Trends

.1 Public Online Information Retrieval Services is already a billion-dollar industry in the U.S. and it is growing very rapidly. Order-of-magnitude estimates regarding the size of the industry are probably reliable, but data given in industry studies need to be checked for source and quality. Such verification has not been possible for the present report.

.2 Governments and non-profit agencies are major providers of information, but commercial enterprises predominate as information distributors and database vendors.

.3 Available estimates of current industry revenues range from $500m in 1979 (Kiechel) through $630m (CSI) to $800m (Link) in 1980, to $1250m in 1981 (IRD). All these figures are in current U.S. dollars. The IRD estimate, however, includes over $150m of revenues from transactional databases and it also includes revenues to both database producers and vendors. Thus the estimates of revenues for 1980 to vendors of Public Online Information Retrieval Services lie in the range $600-900m, with an average value of $750m. Only Input (Ref. C5) comes up with a much higher estimate of $1.4 billion for the size of the 1980 U.S. Online Database markets. Further analysis is required to reconcile differences of this magnitude.

.4 High growth rates are projected over the next 5-10 years, but there is some difference between IRD and the other sources. IRD projects a quadrupling of revenues to $5.5 billion (in 1981 dollars) in 1991. This is equivalent to a real compound annual growth rate of 16% over the next 10 years. LINK, starting from a base of $795m in 1980, projects a nominal 34% compound annual growth rate over the next 5 years to $3.4 billion in 1985. CSI, starting from a $630m base, projects a nominal 38% compound annual growth rate to $3.0 billion in 1985. Input, starting from a much larger $1.4b base, projects a nominal 25% compound annual growth rate to $4.2b in 1985. Kiechel states that revenues are increasing at a rate "well over 30% a year". The difficulty in comparing IRD's projected real growth rate with the other nominal growth rates stems from the fact that no deflator of revenues is available. Depending upon the allowance made for inflationary increases over the next decade, IRD's estimates may be conservative compared to those of the others.

.5 The number of databases available to U.S. users, and the number of online service vendors offering these databases, are both growing rapidly. The fall 1981 issue of the Cuadra Directory lists 965 databases offered by 170 domestic and foreign vendors. The corresponding numbers listed in the spring 1981 issue of the same Directory were 770 and 135 respectively; in the fall 1980 issue they were 615 and 93 respectively. It may be noted here that European Association of Information Services (EUSIDIC) in their 1981 Database Guide state that over 1400 "databases" in every field of interest are now (1980) available to the European public (up from a little over 400

in 1975). Closer analysis reveals that only some 500 are accessible online, the others being offered only for batch or offline operations. In the context of this study, the latter would be considered to be data files.

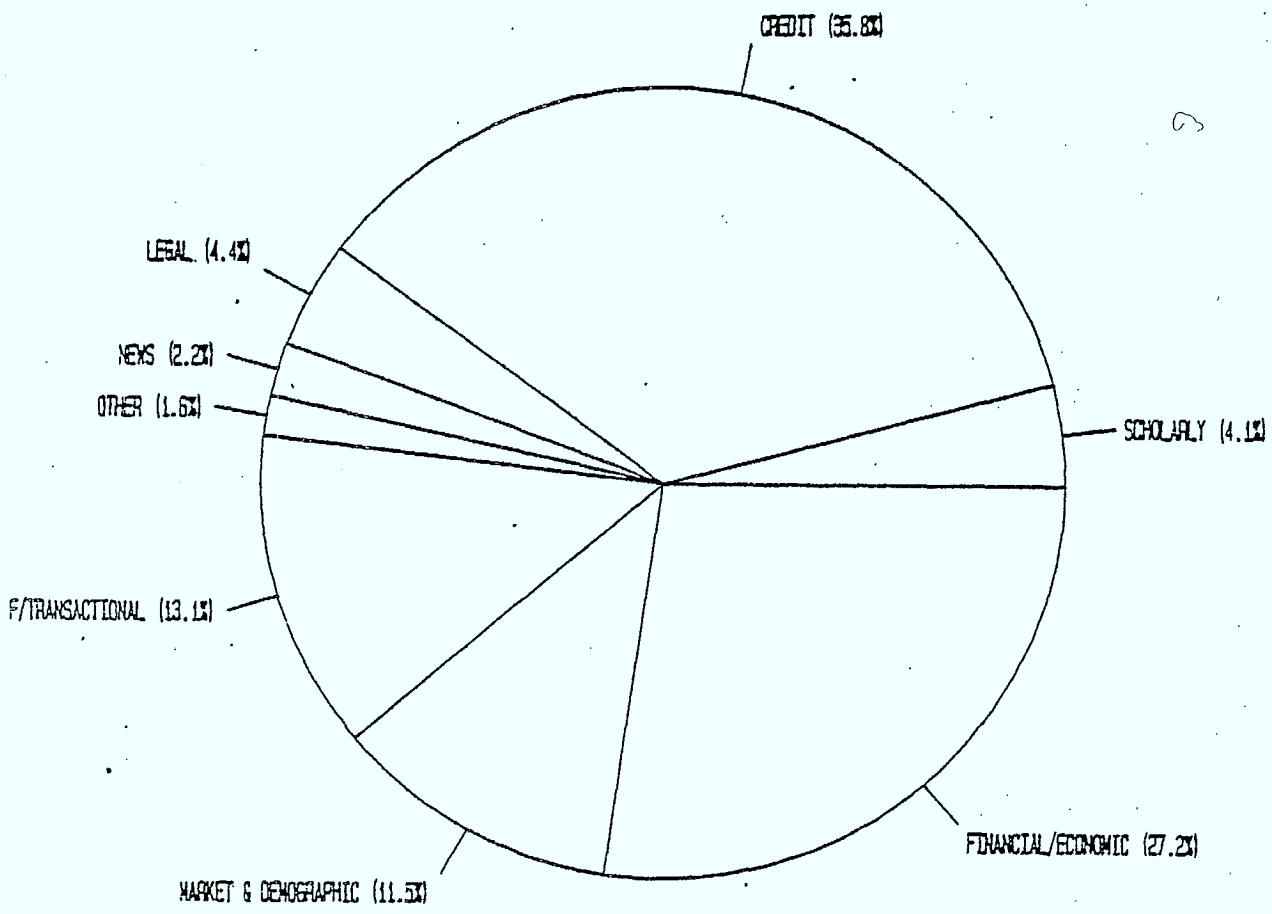
.6 IRD's breakdown of the online database service revenues into sub-markets, and the growth projections by sub-market to 1991, are shown in Table 8.1. Input's breakdown for 1979 and 1985, and growth projections are shown in Table 8.2. LINK's breakdown of online distributor revenues in 1980 is shown in Table 8.3. All these sources highlight the relatively small size of the Reference/Bibliographic sub-market, and the crucial importance of the Source/Numeric sub-market, which includes Financial, Socio-Economic, Credit, Marketing and Demographic databases. According to IRD, this sub-market produced revenues of $937m (74.6% of the total) in 1981 and is forecast to produce revenues of $4,387m (78.6% of the total) in 1991. This is an increase of 368% over 10 years, equivalent to a compound annual growth rate of 16.7%.

.7 Revenues of the top 10 U.S. database vendors are shown in Table 8.4. These 10 firms had combined revenues of $255m, which is 34% of the average value of $750m estimated for the size of the U.S. market. Numbers of subscribers for the top 20 companies (ranked by subscriber count) are shown in Table 8.5. The total number of subscribers in October 1981 was over 150,000. Comparison of Tables 8.4 and 8.5 shows that there is no clear correlation between customer revenues and counts. Both McGraw-Hill and Mead Data Central typify vendors who have adopted the high price - low volume strategy in going for major

GRAPH 8.1

U.S. ONLINE DATABASE SERVICES REVENUES

BY TYPE OF MARKET FOR 1981*

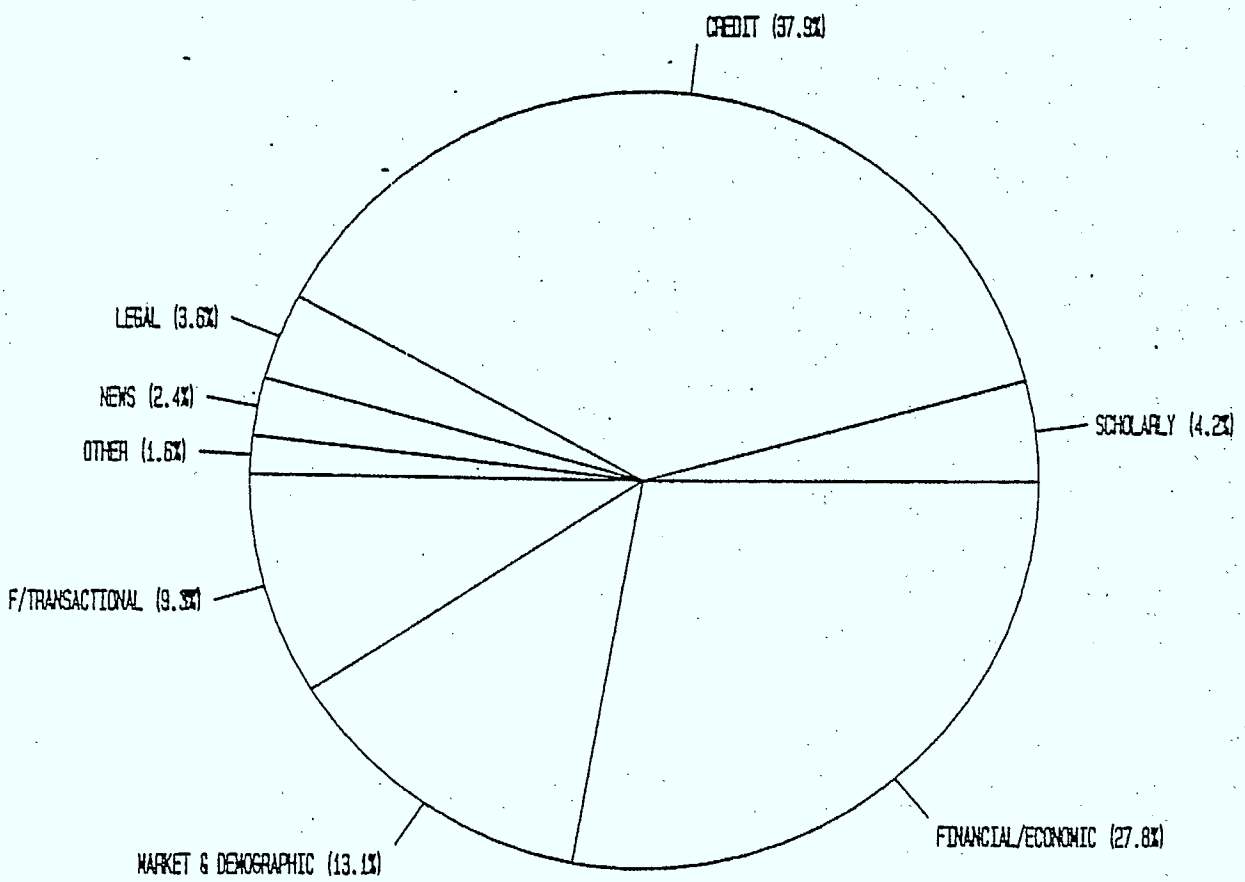



*SOURCE: KNOPPERS & NEOGI, REPORT ON PUBLIC ONLINE INFORMATION RETRIEVAL SERVICES, TABLE 8.1.

GRAPH 8.2

U.S. ONLINE DATABASE SERVICE REVENUES

BY TYPE OF MARKET FOR 1991*




*SOURCE: KNOPPERS & NEOGI, REPORT ON PUBLIC ONLINE INFORMATION RETRIEVAL SERVICES, TABLE 8.1.

Table 8.1: U.S. Online Database Service Revenues 1981 - 1991

(Millions of 1981 U.S. $)

| Database Service Markets | Type of Database | | 1981 | | 1983 | | | 1986 | | | 1991 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Primary Classification | Secondary Classification | Revenue ($m) | % Total | Revenue ($m) | % Total | % Growth from 1981 | Revenue ($m) | % Total | % Growth from 1981 | Revenue ($m) | % Total | % Growth from 1981 |
| Scholarly | Reference | Bibliographic, Referral | 51.5 | 4.10 | 72 | 3.67 | 40 | 117.5 | 4.00 | 128 | 235 | 4.21 | 356 |
| Financial/Economic | Source | Numeric | 342 | 27.22 | 468 | 23.88 | 37 | 769 | 26.16 | 125 | 1,547 | 27.71 | 352 |
| Credit | Source | Numeric | 450 | 35.81 | 858 | 43.78 | 91 | 1,195 | 40.65 | 166 | 2,108 | 37.76 | 368 |
| Marketing and Demographic | Source | Numeric | 145 | 11.54 | 198 | 10.10 | 37 | 334 | 11.36 | 130 | 732 | 13.1 | 405 |
| Legal | Source | Full-Text | 55 | 4.38 | 75 | 3.83 | 36 | 117 | 3.98 | 113 | 197 | 3.53 | 258 |
| News | Source | Full-Text | 28 | 2.23 | 36 | 1.84 | 29 | 59 | 2.01 | 111 | 136 | 2.44 | 386 |
| Patents | | | 7 | | 10 | | | 14 | | | 26 | | |
| Government/Watch | | | 10 | | 14 | | | 25 | | | 64 | | |
| Lists | | | 3 | | 4 | | | 7 | | | 19 | | |
| - Sub-Total | | | 1,091.5 | 86.87 | 1,735 | 88.52 | | 2,637.5 | 89.73 | | 5,064 | 90.70 | |
| Financial/ Transactional | | | 160 | | 214 | | 34 | 272 | | 70 | 438 | | 174 |
| Other Transactional | | | 5 | | 11 | | | 30 | | | 81 | | |
| - Sub-Total | | | 165 | 13.13 | 225 | 11.48 | 36 | 302 | 10.27 | 83 | 519 | 9.30 | 215 |
| - TOTAL | | | 1,256.5 | 100 | 1,960 | 100 | 56 | 2,939.5 | 100 | 134 | 5,583 | 100 | 344 |

Source: International Resource Development (IRD) Inc. (Ref. C1)

Table 8.2: U.S. Information Retrieval Market

(Millions of U.S. $)

| Subject Matter/Area | Type of Datatbase | | 1979 | | 1985 | | Growth from 1979 | |
|---|---|---|---|---|---|---|---|---|
| | Primary Classif. | Secondary Classif. | Revenue. ($m) | % of Total | Revenue ($m) | % of Total | Total % | Comp. Ann. Rate (%) |
| Bibliographic | Ref. | Bibliog. | 62 | 5.30 | 255 | 5.96 | 311 | 27 |
| Econometric | Source | Numeric | 67 | 5.74 | 200 | 4.68 | 199 | 20 |
| Economic and Financial | Source | Numeric | 125 | 10.70 | 400 | 9.36 | 220 | 24 |
| Stock and Commodity Markets | Source | Numeric | 140 | 12.0 | 300 | 7.02 | 114 | 13 |
| Credit | Source | Numeric | 240 | 20.54 | 724 | 16.94 | 202 | 20 |
| Market Research | Source | Numeric | 105 | 9.0 | 510 | 11.93 | 386 | 30 |
| Demographic | Source | Numeric | 36 | 3.08 | 135 | 3.16 | 275 | 24 |
| Natural Resources | | | 16 | 1.37 | 96 | 2.25 | 500 | 35 |
| Industry Specific | | | 37 | 3.16 | 126 | 2.95 | 241 | 23 |
| Real Estate | | | 45 | 3.85 | 175 | 4.09 | 289 | 25 |
| Patents | | | 22 | 1.88 | 95 | 2.22 | 332 | 28 |
| Legal and Accounting | Source | Full-Text | 75 | 6.42 | 360 | 8.42 | 380 | 30 |
| News | Source | Full-Text | 40 | 3.42 | 235 | 5.50 | 488 | 34 |
| International | Ref. | Bibliog. | 18 | 1.54 | 70 | 1.64 | 289 | 25 |
| Other | | | 140 | 12.0 | 594 | 13.88 | 324 | 26 |
| TOTAL | | | 1,168 | | 4,275 | | 266 | 24 |

Source: Input Ltd. "International Market Opportunities for on-line database services" Sept. 1980 (Ref. C5).

Table 8.3: Online Distributor Revenues for 1980

Interactive Public Databases by Discipline

(Revenues in Millions of U.S. $)

| Discipline/ Subject matter | Type of Database | | | | | |
|---|---|---|---|---|---|---|
| | Source | | Reference | | Total | |
| | Amount ($m) | % Total | Amount ($m) | % Total | Amount ($m) | % Total |
| 1. Scientific and Technical | 14.04 | 1.91 | 18.15 | 29.20 | 32.19 | 4.05 |
| 2. Business and Social Science | | | | | | |
| - Business | | | 6.04 | 9.72 | | |
| - Social Science and Hum. | | | 6.25 | 10.05 | | |
| | 690.36 | 94.14 | 12.29 | 19.77 | 702.65 | 88.33 |
| 3. Multidisciplinary | 28.94 | 3.95 | 31.72 | 51.03 | 60.66 | 7.62 |
| 4. TOTAL | 733.34 | 100. | 62.16 | 100. | 795.50 | 100. |
| | | 92.19 | | 7.81 | | 100. |

Source: LINK Resources (Ref. C4).

Table 8.4: Top Ten U.S. Database Distributors Ranked by Estimated 1980 Revenues ($m)

| Distributor | Revenues ($m) | % of Total | Remarks |
|---|---|---|---|
| McGraw-Hill/DRI/ Standard and Poor's | 53 | 20.78 | °Socio-economic, Financial and Credit Rating services. |
| Mead Data Central | 34 | 13.34 | °Provides legal (LEXIS) and news (NEXIS) full text databases. |
| OCLC | 27 | 10.59 | °Non-profit corporation providing library systems/services in a shared, cooperative mode. |
| Dialog (Lockheed) | 25 | 9.80 | °Largest Search Service; over 130 Reference databases, 40m citations. |
| Equifax, Inc. | 25 | 9.80 | °Consumer credit databases. |
| Bunker Ramo | 20 | 7.84 | °Banking services to domestic and international markets. |
| Reuters | 18 | 7.06 | °News databases, money market services. |
| Dow Jones and Co. | 18 | 7.06 | °Worldwide business, economic and financial news; stock market information. |
| Dun and Bradstreet | 18 | 7.06 | °Largest private source for commercial credit and business information. |
| PRC Realty | 17 | 6.67 | ° |
| TOTAL | 255 | 100. | |

Source: IDP Report, Vol. 2, No. 13, August 14, 1981
Knowledge Industry Publications Inc.

Table 8.5: Selected U.S. Database Distributors Ranked by Estimated Customer Count

| Distributor | Customer Count | | | 1980 Revenues ($m) |
|---|---|---|---|---|
| | Mid-1981 | Oct. 1981 | 3 month % change | |
| TRW Inc. | 22,000 | 24,000 | 9 | |
| Equifax Inc. (1) | 22,000 | (22,000) | - | 25 |
| Dow Jones and Co. | 15,000 | 20,250 | 35 | 18 |
| Control Data Corp. | 15,000 | 15,000 | 0 | |
| CompuServe | 12,000 | 15,000 | 25 | |
| Dialog (Lockheed) | 13,000 | 13,500 | 4 | 25 |
| The Source | 11,000 | 11,500 | 4 | |
| PRC Realty (1) | 10,000 | (10,000) | - | 17 |
| GE Info. Services | 6,000 | 6,000 | 0 | |
| Systems Development Corporation (SDC) | 6,000 | 6,000 | 0 | |
| Comshare Inc. (1) | 4,500 | (4,500) | - | |
| Telerate | 3,500 | 4,000 | 14 | |
| Bunker Ramo Corp. | 3,500 | 3,500 | 0 | 20 |
| Reuters/Monitor/Dealing | 3,000 | 3,000 | 0 | 18 |
| OCLC | 2,621 | 2,700 | 3 | 27 |
| Dun and Bradstreet (DUNSPRINT) | 2,231 | 2,400 | 7 | 18 |
| New York Times Information Service | 2,000 | 2,300 | 15 | |
| BRS, Inc. (1) | 2,000 | (2,000) | - | |
| Tymshare (2) | - | 2,000 | - | |
| Chase Econometric/IDC | 2,000 | 2,000 | 0 | |
| Medline (2) | - | 1,550 | - | |
| McGraw-Hill/DRI/S&P | 1,000 | 1,150 | 15 | 53 |
| Mead Data Central | 750 | 800 | 7 | 34 |
| Total: Excluding (2) | 159,102 | 171,600 | 8.0 | |
| Including (2) | | 175,150 | | |
| Excluding (1), (2) | 120,602 | 136,650 | 10.4 | |

Source: IDP Reports, Vol. 2, No. 13, August 14, 1981.
Vol. 2, No. 17, October 23, 1981.

Notes:

(1) Companies for which October 1981 count not available; set equal to mid-1981 count.

(2) Companies for which mid-1981 count is not available.

clients. Compuserve and The Source represent the low price - high volume model for consumer information services.

.8 By way of comparison, the revenues of the U.S. computer services industry were estimated by Input Ltd. as $14.9b in 1980, of which $8.8b came from processing services. A $750m market for public information services would be about 8.5% of the market for processing services. A size range of $600m (low) to $1.4b (high) would correspond to 6.8 - 15.9% of the market for processing services. In making these comparisons, the problem of potentially double counting the revenues of certain computer service bureaus must be kept in mind.

## 8.2 Reference Databases

Reference databases account for some 40% of the total number of online databases, but only some 10% of the revenues. The reference database sub-market in the U.S. is dominated by three major private search services and two non-profit organizations. These are:

i) Dialog Information Systems, a subsidiary of Lockheed Corporation, which offers access to some 130 databases via its DIALOG service. It had revenues of $25m in 1980, and some 13,500 subscribers in October 1981 (See Tables 8.4 and 8.5).

ii) Systems Development Corporation, (SDC), a subsidiary of Burroughs Corporation, which offers access to over 70 databases via its ORBIT service. SDC had some 6,000 subscribers in October 1981.

iii) Bibliographic Retrieval Services, (BRS), a subsidiary of Information Handling Services, which offers access to some 40 databases; it had some 2,000 customers in October 1981.

iv) The National Library of Medicine, (NLM), a non-profit organization which offers the Medline Service. Some 1,550 institutions currently subscribe to Medline. About 1.8m searches were recorded in 1980, and the 1981 total is expected to be even greater.

v) OCLC Inc., a non-profit organization whose primary customers are some 2,700 libraries. It had revenues of $27m in 1980. In October 1981, it had 2,700 subscribers accessing its services via some 4,100 terminals. Subscribers and terminals are growing at about 20 and 50 per month respectively.

IRD expects the "Scholarly research" sub-market, which covers the major portion of the reference database sub-market, to increase from $51.5m in 1981 to $235m (in constant 1981 dollars) in 1991. This is a 16% compound annual growth rate over 10 years, for a total growth of 356%. CSI forecasts a nominal 27% annual growth rate in reference database revenues, from $65m in 1980 to $220m in 1985. CSI estimates that some 3.5 million searches were conducted through U.S. public places in 1980. Some surveys indicate that only 5% of the potential market has been tapped.

Reference/Bibliographic databases tend to be less business oriented than source databases. Studies by LINK and Wanger et al. have found that more than 50% of the bibliographic/referral databases deal with the physical sciences

and technology, while another 30% deal with the social sciences and humanities, or are multidisciplinary. Reference databases dealing with business subjects account for only some 10% of the total number.

Partly because of their non-business orientation, reference databases tend to be less expensive to use than source ones. Connect charges for the use of non-business reference databases range from $25-75 per hour. Since the price/cost margin is narrower, and the overhead fixed costs very considerable, the vendor must attract a large number of users to make a reasonable profit.

## 8.3 Source Numeric Databases

Source numeric databases constitute both the largest sub-market, and one of the fastest growing ones. These databases are often used by decision makers directly, without the intervention of intermediaries. IRD breaks down this sub-market further into three segments: Financial/Economic, Credit and Marketing/Demographic (See Table 8.1).

### 8.3.1 Financial/Economic

Revenues for this area are expected to increase by 352% from $342m in 1981 to $1,547m in 1991; the market share being about 27% of the total. These databases are used by business executives to help them make a wide variety of corporate decisions extending through all phases of corporate and financial planning.

Many of these databases are econometric. They are often marketed along with econometric forecasting models, model building software and economic consulting services. Data Resources Inc. (DRI), Chase Econometric Associates, Wharton Econometric Forecasting Associates and Citibank are the major producers of econometric databases. The first three organizations are subsidiaries, respectively, of McGraw-Hill Inc., Chase Manhattan Bank and the Ziff-Davis publishing company.

Financial analysts and stockbrokers make very extensive use of public information services. Access to and use of continuously updated stock market information has virtually become a condition of doing business. Penetration of this market by vendors like Quotron and the Dow Jones News/Retrieval Service is virtually 100% in all major cities, and quite high even in smaller ones. Recently, Dataline (Toronto) has begun offering its CANQUOTE service of updated stock market information.

### 8.3.2 Credit Databases

Revenues in this area are expected to increase by 368% from $450m in 1981 to $2,108m in 1991, and the market share from about 36% to 38% of the total. There are four types of credit databases: consumer credit, commercial credit, cheque evaluation and credit card verification. They are used by organizations, mostly banks and retail stores, for assessing the financial reliability of a customer or the validity of the potential customer's promise to pay.

i) Consumer Credit Databases

Over 80% of the 78 million U.S. households are currently logged on one or more consumer credit databases. The leading producer of such databases is TRW. Others include Equifax, Trans Union and ACS. The immense amounts of data to be gathered, its frequently unreliable nature, and the enactment of consumer protection legislation all combine to increase the costs of doing business for consumer credit database producers.

ii) Commercial Credit Databases

Commercial credit reports contain information on such matters as the payment habits of a company, the number of its employees, balance sheet information and the names and histories of its officers/directors. The leading producer of Commercial Credit Ratings is Dun and Bradstreet, whose Business Information Centre provides this information to the U.S. business community. The Dun and Bradstreet Business Information File holds current information on more than 4 million U.S. businesses. The Centre retrieves requested information and mails nearly 50,000 reports daily to subscribers. The file is also available for online searcing from remote locations. TRW is the other major company in the commercial credit business.

iii) Check Evaluation Databases

These databases provide subscribers, usually banks and large retailers with historical information about the reliability of the subject's

cheques. The data are received from participating financial institutions. The largest producer of such databases is Telecredit Inc.

iv) Credit Card Verification Databases

These databases perform two functions. First, they provide information on whether a credit card has been stolen or is otherwise invalid. Second, they tell the subscriber, usually a retail store, if the amount of the proposed credit purchase falls within the card's established credit limits.

Credit card verification is usually performed by the card issuers themselves, e.g., American Express, or the bank card associations like VISA and Mastercard. The revenues of credit rating services are directly linked to the demand for credit and thus responsive to national and regional economic trends. Revenues also depend in large measure upon prevalent payment procedures. Thus the gradual move from paper money and cheques to plastic money (credit cards) has provided a boost to the credit information suppliers. On the other hand, a widespread move to EFT may have the opposite effect. By setting up a direct transfer mechanism between the purchaser's and retailer's bank accounts, EFT takes the time lag out of financial transactions, the very time lag which is responsible for creating the need for credit evaluation.

### 8.3.3 Marketing and Demographic Research Databases

IRD projects significant growth of revenues in this area, from $145m in 1981 to $732m in 1991 which is an increase of 405%, equivalent to a compound annual growth rate of 17.5%. Certainly there is no lack of data for producers interested in developing databases or vendors selling that information to users studying marketing issues. The 1980 U.S. Census alone collected over 3 billion items of data. The private sector database producers and vendors are helped enormously by the fact that the Census Bureau's data can be obtained by them and used for very little cost. Thus the producers are spared almost all of the front-end costs of data gathering, verification and editing.

These databases actually consist of two sub-categories:

i) databases which contain information about potential customers and the products they use; and,

ii) databases which contain information about product sales and the media used to establish contact with those markets.

Significant producers of databases about potential product purchasers include Urban Decision Systems Inc., which provides customers with detailed demographic information about virtually any domestic geographic area, no matter how unusually contoured, Demographic Research Company with its Zip Code Demographic Database and CACI Inc., which produces the Site II and Site Potential databases.

A.C. Neilsen is the premier company among producers of databases about the advertising effectiveness of various media. In addition to producing the

Neilsen Retail Index, the Nielsen Station Index and the Neilsen Television Index it is also an online distributor. A new entry into the marketing database area is AMI, a joint venture of J.W. Thompson and the New York Times Information Bank; its activities are discussed further in the next section under the New York Times Information Service.

## 8.4 Source Full Text Databases

This sub-market can be sub-divided further into Legal Databases and News Databases. The full text approach has been well received within the legal community and large scale penetration of this market is only a question of time. The customer base for general news retrieval services is still small and open to some question. However, should full text access become acceptable to the general consumer population, online database service vendors will be able to count their customers in the millions, instead of the thousands.

### 8.4.1 Legal Databases

Large U.S. legal firms make extensive use of full-text legal databases. The dominant vendor in this area is the Mead Corporation with its LEXIS service, which had some 800 users in October 1981. LEXIS costs include a minimum $500 monthly charge per terminal, plus connect costs of $60-90 per hour. It is facing competition from a new entrant Westlaw, which is offerred by West Publishing Company. These vendors are now trying to penetrate the medium size and smaller legal firms.

The IRD report estimated that revenues from legal databases would increase from $55m in 1981 to $197 in 1991, an increase of 258% in constant terms. The Information and Database Publishing Report (IDP) suggests that this might be an underestimate, because it apparently discounts potentially significant markets such as in-house corporate legal work and governmental use at federal, state and local levels. These markets may be presently excluded to a large extent by current pricing rates. But if major advances are made in searching capabilities, combined with marked reductions in data storage costs, as seems likely with the new videodisk technology, these may combine to open up significant new markets in the field of legal research, with its constantly growing body of case law and the need to capture existing case law retrospectively.

### 8.4.2 News Databases

News databases are expected to be one of the fastest growing areas in the 1980s. The maturing of news information services within public and private organizations, which are beginning to come into their own, combined with the expected evolution in the home information market, should fuel the demand side. On the supply side, major advances in full text storage and retrieval technology are expected to improve price/performance to the extent that news databases could evolve from a research tool for business information specialists to an item of mass consumer interest. The trend from bibliographic formats to full text delivery can be expected to continue.

A number of U.S. vendors already provide full text delivery of news reports. They include the New York Times Information Bank, Dow Jones

News/Retrieval, Mead Data Central's Nexis Service, and CompuServe. These are expected to be joined by a variety of new entrants. The IRD report predicts a 386% revenue growth from just $28m in 1981 to $136m in 1991. This is equivalent to a 17.1% real compound annual growth rate over the decade 1981-91. Two of these services are described briefly below.

a) The New York Times Information Service is a subsidiary of the New York Times Company. Online access to NYTIS is available, by subscription, in the U.S., Canada, Mexico and Europe. The service became commercially operational in 1974. It implemented an enhanced full text free text, easy-to-use search system in the summer of 1981. NYTIS provides access to three databases:

1) The Information Bank, which holds nearly 2 million references to general and specialized publications, including the New York Times, Wall Street Journal, Washington Post, Business Week and Financial Times;

2) Advertising and Marketing Intelligence (AMI), a bibliographic database providing current information about people, new products, consumer trends, promotional programs, media planning and buying; and,

3) Key Issues Tracking (KIT), a current affairs database created jointly by the Executive Office of the President, the Department of Transportation and the Department of Energy.

Usage costs with no commitments vary from $100 - $140 per connect hour, depending upon the database. These hourly connect rates can be substantially reduced under a number of optional commitment contracts.

b) The Dow Jones News/Retrieval Service provides online access to business, financial and economic news from international and domestic sources, to stock market price data and to money market changes. The service is available by subscription. A special Auto-Entry terminal, which was developed to facilitate access, can now be leased from Dow Jones.

News/Retrieval contains up to 90 days of news covering 6,000 publicly held companies. The Stock Quote Reporter enables subscribers to monitor trading quotations on more than 6,000 publicly held stocks. Input to the system comes in the form of up-to-the-minute information from the Dow Jones News Service, Disclosure, Wall Street Journal and Barrons. Quotations are available from the New York Stock Exchange, American Stock Exchange and the Boston, Philadelphia, Midwest and Pacific Exchanges.

Dow Jones News/Retrieval Service had estimated revenues of $18m in 1980. As of October 1981 it had more than 20,000 subscribers, and was adding terminals at the rate of 2,000 per month. A more recent estimate (IDP Vol. 2, No. 21) is 30,000 terminals as of January 1982. Users without commitments pay hourly connect charges of $60 during business hours, and only $12 during non-prime hours. Users paying a $50 per month subscription fee get reduced prime time rates.

## 8.5 Services to the Mass Consumer

Two companies currently provide public information services to the mass consumer on a commercial basis. They are Source Telecomputing Corporation, now owned by Reader's Digest, and CompuServe Inc., now owned by H&R Block. As of October 1981, The Source had 11,500 subscribers and CompuServe's Information Service had 15,000. Prices, while much cheaper than those charged by the major search services like Dialog, are still significant. The Source charges customers a one time sign-up fee of $100, plus a monthly minimum of $10, whether the system is used or not. Hourly connect rates vary from $4.25 to $30, depending upon the databases accessed and the time of day; substantial discounts are given for use during off-peak hours. CompuServe requires a smaller initial sign-up fee of $19.95 but higher hourly connect charges during business hours.

Both The Source and CompuServe are discovering that the fastest growing segment of their customers' demand is for business services. Responding to this demand, The Source has announced a "new series of electronic super services", dubbed The Source PLUS. The new services include Legi-Slate, a database which tracks Congressional legislation, COMPUSTAR, an electronic shopping service; Management Contents Ltd., which offers abstracts from 27 leading business publications, Commodity News Service and Media General. The Source Plus hourly connect rate for 300 baud terminals is $30 during prime time on weekdays, $15 for evening or weekend use and $10 after midnight. The corresponding rates for 1200 baud terminals are $40, $25 and $15 respectively.

CompuServe continues to maintain its position as the leading consumer oriented online information service in the U.S. Its number of subscribers

increased by some 3,000 (25%) from 12,000 in mid-summer to 15,000 in October 1981. CompuServe Inc., the parent company of CompuServe Information Services, had revenues of $27.6m in 1980, an increase of 41% over the 1979 revenues.

Both companies expect to have a major increase in the number of subscribers by 1985. Some executives at The Source have claimed that it alone could have 500,000 subscribers by 1985. The future of these two companies could be greatly affected by the success (or otherwise) of videotex services over the next 5 years. A LINK report (Ref. D11) estimates that by 1985 there will be up to 2.5 million homes in the U.S. receiving videotext or teletex services over telephone lines, cable or broadcast.

IRD estimates that revenues from consumer databases amounted to $3m in 1981. Its expectations are that databases for consumers will become an important market by 1991, with total revenues of $795m for both transactional and public information services. It is expected, however, that most of the growth in the home consumer sub-market will come after 1985. IRD's estimates for the home information services sub-market are $3m in 1981, $21m in 1983, $300m in 1986 and $795m in 1991.

Several reasons are given for this slow initial growth. First, consumers need to be educated about the scope and usefulness of online services. Second, advertisers will be reluctant to lend their full support to such services until a "critical mass" of subscribers is reached. Third, the need for coordination between a wide variety of suppliers, including television set and terminal manufacturers, personal computer manufacturers, telephone companies, cable companies and information providers/producers, may slow down progress.

Finally, it may take another 4-5 years before costs of production decline to a point that the savings, when passed on to consumers, will bring about a widespread penetration of the home information services sub-market. The role of videotex services, acting as a user-friendly "Gateway" to a wide variety of transactional and public information services, may become particularly important.

On the other hand, the current mass consumer market is largely based on microcomputers with communication capabilities. It may well be that the increasing use of microcomputers will for some time be the dominant force in the mass consumer market. BRS is already offering attractive deals for users of microcomputers, thereby hoping to tap a growing sector of the market outside the traditional library/information unit.

## 9. THE EUROPEAN MARKETPLACE

Given the fact that the combined Gross National Product of the European Economic Community (EEC) countries is greater than that of the U.S., the European market for public online information retrieval services is proportionately very small. Various estimates put it at between 10% and 20% of the U.S. market. This is in contrast to the Western European data processing services market, which in 1982 was estimated at some U.S. $11.5 billion, or 53% of the U.S. market. Of course, the problem of demarcation between data processing services and online information retrieval services also applies to data on the European marketplace.

Compared to the North American market, the following characteristics stand out. First, the Western European market, though geographically more compact, is less homogeneous. It is not served by an integrated telecommunications network in the way that the North American market is. Available public data networks are less sophisticated and cost-effective, while private data communications networks are less easy to configure. The British, French, German and Italian markets have a degree of differentiation, based on differences in language, institutions and practices, which is not found in North America. Finally, on the supply side, the European PTTs have taken a lead role in providing a gateway service through Euronet/Diane, and in pushing videotex-based mass consumer services.

The European market can be considered to be in its infancy, compared to the more mature U.S. market. Its growth should be greatly enhanced by growing

business demand for financial and economic information, and by the activities of the European PTTs, both in the provision of national and regional public data networks and gateway services to a host of information providers.

## 9.1 Overall Market, Growth and Usage Trends

Table 9.1 gives various estimates for the size and anticipated growth rate of the European market for online database services. It should be noted that the base year and the period varies for each study.

According to the Link/IDC study, the market will grow from U.S. $186 million in 1981 to $651 million in 1987, with a compound annual growth rate of 23%. Frost and Sullivan estimates an online database market of $195 million in 1979, growing at 19% a year to $919 million in 1988. The Input estimate is very different. It starts with a much lower market size of $123 million in 1980, but projects a 63% compound annual growth over five years to reach $1,399 million in 1985. Compared to the other estimates of growth for the European and U.S. markets, the Input growth rate seems excessively high, even when the embryonic state of the European market is taken into account.

IDC limited its survey to online information retrieval services but included the highly profitable private networks which serve the financial and banking sector. IDC estimates this sector alone accounted for $165 million in 1981. The sector is dominated by Reuters, the financial and economic news and money market information service owned by a consortium of British and Australasian newspapers, which is estimated to account for 73% of the turn-over. It is followed at a distance by Datastream (U.K.), Telerate (U.S.) and Telekurs (Switzerland).

Table 9.1

Revenue Estimates and Projected Growth Rates for European Online Database Services

(Revenues in Millions of Current U.S. Dollars)

| Source | Type of Services | Coverage | | Gross Revenues ($m) | | Compound Annual Growth Rate % |
|---|---|---|---|---|---|---|
| | | Area | Period | Initial Year | End Year | |
| IDC (1) | Online Databases | Europe | 1981-1987 | 186 | 651 | 23.2 |
| Input (2) | Online Databases | Europe | 1980-1985 | 123 | 1,399 | 62.6 |
| | Online Databases | U.S. | 1980-1985 | 1,436 | 4,275 | 24.4 |
| Frost & Sullivan (3) | Online Databases | Europe | 1979-1988 | 195 | 919 | 18.8 |
| | Databases and Related Services (a) | Europe | 1979-1988 | 587 | 1,672 | 12.3 |

Notes: (a) Estimates recently updated to $757 million (1982) and $1,800 million (1987), giving a projected growth rate of 18.9% for 1982-87.

Source: 1. International Data Corporation (IDC), Online Database Services Market, Western Europe, 1981-87 (August 1982).

2. Input Ltd., Online Database Services Market Strategies, Vol. III (July 1981).

3. Frost & Sullivan, Data Base Markets in Europe, (October 1980).

For the purely online information retrieval type access to databases and data banks, IDC estimates an average annual growth rate of 26%, with the market growing to $77.3 million by 1987. Presently, Britain is the dominant national market but this market is not expected to expand as fast as those of other countries, especially West Germany. The latter is the fastest growing market and is expected to grow from a low of $15 million in 1981 to $59 million in 1987, for both general and financial database sectors. The second Frost & Sullivan estimate, which includes not only online, but also off-line or batch services, i.e. where database tapes are leased out and consultancy services related to information search are included, estimated the market at $587 million in 1979, growing to $1,800 million in 1987. In this estimate, France, West Germany and Great Britain each account for about 25% of the total European market, while the other European countries account for the balance.

The average European on-line user spent some 7 hours and $1,500 per month in 1981, searching scientific, technical, legal and socio-economic data bases. This is a dramatic increase over 3.5 hours per month and a median expenditure of $240 in 1978.

## 9.2 The Mass Consumer Market

The reasons for the slow growth of the mass consumer market in North America have been outlined in section 8.5. The European PTTs, especially those in Britain, France, the Netherlands and Germany, have taken a lead role in attempting to develop this market using videotex based services. The Prestel, Teletel, Bildschirmtext and Viditel services are described briefly in Appendix E.

The harsh reality is that the information products exhibited in the various videotex demonstrations conducted in the United Kingdom, France, Germany, the Netherlands, Japan, Canada and the United States, or offered on a limited commercial basis, have so far failed to attract a regular, clearly definable mass audience. This is not surprising for systems which have been designed without reference to the special needs or wishes of any particular group of potential users. Systems like GRASSROOTS, which focus on the needs of a particular group of users, have been more successful.

The promoters of PRESTEL in the United Kingdom were at first directing all their efforts to the home market, then changed their mind and turned to the business market, without substantially changing the system or the products offered. In contrast to the original predictions running into millions, the British system has stagnated at about 20,000 subscribers.

The French PTT's strategy has also been modified several times, as the emphasis shifted from cheap, mass-produced terminals to be substituted for the traditional telephone directories, (the savings from which were supposed to pay for the development of simple videotex terminals, to be given away by the PTTs), to a very ambitious scheme aiming at cable/TV wiring throughout France within the next 10-15 years. The Teletel trial has, however, produced useful experience with the gateway concept and transactional services.

The German approach, at first cautious, has become enthusiastic as of late. From several theoretical studies and after extensive trials, the Bundespost officials concluded that their Bildschirmtext must not only provide

information of general or local interest, but must also allow for direct linkage between the customers and the computers of department stores, mail-order houses, banks, and other institutions, thus opening the way for teleshopping, for electronic money transfers, and the like. Some 1,500 companies are said to be supporting the scheme, which they plan to use for boosting their sales of products and services.

The Bundespost's optimistic forecasts of the number of Bildschirmtext terminals in use (supposedly rising from 12,000 at the end of 1983 to 150,000 next year, over one million by 1987 and two million in 1988) will have to be further scaled down, as a result of IBM's inability to meet the contractual deadline for delivery and testing of a network of 12 central computers serving as gateways and their complex programming. Part of the system, however, is almost fully operational, including the gateway hosts in Berlin and Dusseldorf and test results are very encouraging.

In spite of starting delays and slow growth, the fact remains that the British, French, Dutch and West Germany PTTs have national videotex services in operation or under development. This is in sharp contrast to the U.S. scene where, because of regulatory and institutional constraints, AT&T has been debarred from directly offering such services. In Canada, Bell Canada dropped its Telidon VISTA field trial after its completion, in favour of INET, which is based on the gateway concept.

## 9.3 Supply Side Characteristics

IDC identified over 100 online information service providers (i.e. hosts) of the EURONET DIANE type, who are active in the European market. The hosts offer access to scientific, technical, legal, social and economic databases over public data networks. Euronet Diane acts as a gateway to the majority of European public database distributors, who do not maintain private telecommunications networks.

Many of the major North American database vendors are active and significant suppliers in the European market; examples include Dialog, SDC, I.P. Sharp, DRI and GEISCO. The reverse is not true, with the exception of Reuters, whose operation is outlined below.

### 9.3.1 Financial Service Suppliers

Reuters, the international news gathering agency, has repackaged its general news service, offering it with the latest prices from international financial markets for stocks, bonds, money, oil, gold, commodities and shipping as a computerized on-line information service. These electronic business information services of Reuters now account for some 90% of sales and almost all of its profits. Both sales and profits have increased spectacularly over the last 5 years. Sales grew from some U.S. $169 million in 1980 to $254 million in 1981 and about $360 million in 1982 while pre-tax profits increased from $7 million in 1979 to $72 million in 1982.

Reuters financial services are aimed at companies, banks and stockbrokers. There are now 47 monitor services providing worldwide monitor coverage to various financial markets including currencies, oil, equities, gold, shipping, bonds and commodities. The biggest advance came in 1981, when a dealing service was introduced. Special Reuters CRT monitors have been installed at over 11,000 subscribers in over 61 countries. In addition to having access to the current general news, commodity and stock prices, exchange rates, etc., subscribers can reach any one of 200 banks in 23 money centers and can execute transactions as buy or sell currencies. Foreign exchange and bullion dealers can buy and sell to each other on the screen in seconds, and get a record of their transactions. The service has sold itself to 37 of the world's top 50 banks.

In 1981, only 17% of Reuters revenues originated in North America, but with the development of its worldwide monitor coverage and dealing services, Reuters plans to expand in North America on the basis of its services to the financial community. This would put it in competition with vendors like Dow Jones News Retrieval, Quotron Inc. and Telerate. Reuters' comparitive advantages lies in its superb, worldwide information collection mechanisms, which are already in place, the adoption of its services by the major international banks and the entry of small (regional or local) U.S. banks and other financial institutions into the international money market.

### 9.3.2 Bibliographic Service Suppliers

Among the top five hosts for bibliographic services, three were European. DIALOG (U.S.) was the most popular, followed by ESA-IRS (Italy),

SDC-Derwent (U.S. and U.K.), BLAISE and Telestemes-QUESTEL (France). Of these, DIALOG, SDC-Derwent and ESA-IRS account for some 65% of the market for reference databases.

## 9.4 Support for Database Creation

While it is beyond the scope of this report to cover the variety of actions the different European governments have taken to support the creation of databases and thereby online information retrieval services, it should be noted that via the Commission of European Communities, the EEC countries have launched a coordinated effort to support the creation of databases.

The reasons for this initiative were four-fold,

- European countries wanted to have an indigenous information industry from both the perspective of participating in the information age and as a counterweight to U.S. predominance;

- to assist in bringing existing machine readable data files or databases to market by making the data available for mass distribution via online service vendors;

- to encourage the creation of databases the content of which will support the needs of specific sectors of industry and/or research, e.g. those areas targeted as having a high priority for development; and,

- to try to identify possible "special information service mandates or "market niches".

The Commission offers financial support over the initial development phase of selected data creation projects (between 25% - 50% of the development costs) in order to get them off the ground.

A second Call for Proposals launched by the Commission in July 1982 for the development of new European information services attracted 170 proposals, worth in total almost $100 M (U.S.), from 220 organizations in all member countries. The proposals made were in the following areas:

118 - trade and energy sector;
34 - social sciences;
10 - energy saving and alternative resources; and,
8 - other areas.

The object of the Call is to encourage the production and marketing of new data banks or the extension of existing services in the current range of database available to the on-line user. This follows a first Call which was launched in 1979 and which resulted in 266 proposals of which 26 were selected for EEC support.

Table 9.2

Breakdown of Publicly Available Databases by Type of Producer

| Country | Percentage Share of Databases by Type of Producer (%) | | | Comments |
|---|---|---|---|---|
| | Private Industry | Academic and Non-Profit R&D | Government Agencies | |
| United States | 62 | 18 | 20 | On the whole, U.S. databases are larger and started with U.S. government agencies but now their distribution and maintenance is done by the private sector. |
| United Kingdom | 38 | 32 | 30 | |
| France | 30 | 31 | 39 | |
| Italy | 10 | 90 | | |

Source: INSPEC, The Specialized Information Market-Place and Public Policies Towards Specialized Information Services: The European and United States Situation
EEC - Sponsored Study, 2nd. Interim Report.

According to one source, some 66% of all publicly available data in the EEC countries came from government or publicly financed databases, as against only 34% in the U.S. INSPEC gives a somewhat different breakdown, which is shown in Table 9.2. It is worth emphasizing, however, that the numbers and percentage shares of databases in the private and public sectors does not correlate with usage volumes and revenues to vendors. The databases offered by the private North America vendors are usually much larger, and account for a much greater share of revenues, than the public databases.

# 10. THE CANADIAN MARKETPLACE

## 10.1 Overall Size and Growth Trends

The Canadian federal government and its agencies have taken a more active role in the production and distribution of online databases than is now the practice of their U.S. counterparts. Examples would include CANSIM, CISTI and Telidon (Appendix B, C and E).

It is difficult to attempt a precise estimate of the size of the Canadian marketplace, or its growth rate, since no published data are available. An order-of-magnitude estimate of the size in 1980 would be greater than $10m and less than $100m. It is inappropriate to assume that the Canadian market in 1980 was 10% of the U.S. one, which was estimated at $600 - $900m (U.S.). If an estimate of 5-7%, corresponding to a smaller proportionate size and a 1 year time lag is used, this would give a range of $20-45m, with an average value of $32.5m.

For lack of a better estimate, the real and nominal growth rates for the overall Canadian market will be assumed as 16% (IRD) and 30% respectively. This nominal growth rate would produce a 1985 market size range of $75-167m. On the other hand, if the high CSI estimate of a 38% compound annual growth to 1985 is used, this would produce a market size range of $100-$225m.

Evans Research Corporation has estimated (Ref. B12) that the 1981 Canadian services market for online public databases, including exports, will be about $30m. The report also states that "If more Canadian service companies,

and more importantly Canadian firms, learn the usefulness of public databases, the Canadian market could be $100m by 1985". Although the basis for these estimates is not explained, they are well within the range of the above estimates, the only problem being the potential magnitude of exports.

By way of comparison, Evans Research Corporation estimated the 1980 revenues of the Canadian computer services industry as $1,060m. The revenues of the top 35 Canadian computer service bureaus were $463m in 1980. CADAPSO estimated processing revenues to be 78% of the total, or $827m. A more realistic estimate of 1980 processing revenues, made by DOC, is $575m. Using the lower figure of $575m would give a public information services market of 3.5-7.8% of the processing services market; using the higher figure of $827m would give a market size of 2.4-5.4%. In section 8.1, it was shown that the comparable U.S. figure is 8.5%, with a range of 6.8-15.9%. Assuming that the Canadian market for public information services lags the U.S. one by a year, a range of 6-7.5% of the processing services market may be an appropriate assumption. This would produce a range estimate of $34.5-$43.0m.

## 10.2 Reference Databases

The general observations made about reference databases in describing the U.S. sub-market (Section 8.2) are also valid for the Canadian sub-market. The main difference is that the three major U.S. private search services, Dialog, SDC and BRS, compete strongly in the Canadian sub-market with the Canadian vendors, CISTI, QL Systems Limited and Informatech. The operations of CISTI and QL Systems are described in detail in Appendix B. SDC's services are marketed in Canada by Infomart. The Health Sciences Resource Centre of CISTI is

Canada's national coordinator for access to bio-medical information in the MEDLAR's databases of the U.S. National Library of Medicine.

Most Canadian online search service centres are located in governmental and academic organizations, more specifically, in libraries or information centres. Many Canadian reference libraries, including about one third of the libraries in post-secondary institutions, offer online bibliographic search services. Most of these libraries subscribe to CISTI's CAN/OLE System or QL/Search (a private sector company), as well as one of the U.S. search services. Recent studies (Ref. A6, A14) have shown that the average reference library subscribes to three search services. SDC/ORBIT, CAN/OLE, Dialog and QL Systems represents the ranking of search services by the number of centres using them.

Many Canadian online search service centres (45.5% according to Ref. A14) operate on a free basis for their customers. Each centre conducted an average of 430 online searches per year in 1978-79 while the total number of searches was 161,280 for the 380 centres surveyed.

CISTI and QL Systems Ltd. had revenues of about $2m in 1980. Informatech's total revenues were about $0.5m. Assuming that these three Canadian vendors accounted for some 40% of total use, this would produce an estimate of $6m for the size of the Canadian sub-market in 1980.

## 10.3 Source Numeric Databases

CANSIM is the most widely distributed and used socio-economic database in Canada, with one primary and ten secondary distributors, including most of

the important service bureaus. Precise usage statistics are not available as yet, but there were approximately 4m series retrievals in 1980 (See Appendix C).

I.P. Sharp Associates is the largest Canadian vendor of source numeric databases. It offers over 60 databases (see Appendix D) and 20 million time series in such areas as Economics, Finance, Aviation, Energy and Insurance, as well as a worldwide packet-switched telecommunications network providing access from over 400 cities in North America, Europe, the Far East and Australia. In 1980-81, the firm had total revenues of $35.5m, but it is difficult to assign a specific figure for information retrieval. About one-third of Sharp's revenues came from domestic Canadian usage, another one-third from exports to the U.S., and the remaining one-third from exports to Europe and the Far East.

No firm estimates can be made at this point regarding the size of the sub-market for numeric databases, which includes socio-economic, financial, credit, marketing and demographic databases. If the U.S. experience is any guide, this is by far the largest sub-market and could constitute up to 75% of the total market for public information services. A 75% market share would give a sub-market size range of $15-34m. It is possible, however, that the Canadian sub-market is developing more slowly than the U.S. one, because Canadian firms are making less use of such services to aid the decision making process.

## 10.4 Source Full Text Databases

There are two major Canadian vendors in this area: QL Systems and Info Globe. Their activities are described in detail in Appendix B.

QL Systems is the only Canadian vendor providing legal full-text databases. Current usage is very small, but growth prospects are considered excellent in the 1980s. Potential clients include the courts and legal firms of almost any size.

InfoGlobe, a subsidiary of the Toronto Globe and Mail, was the first North American vendor to offer a full text news database, with full-text free-text search capabilities. The Canadian content of its product is unique, and the product is competitive. QL Systems has just started to offer a news database called NEWSTEX on behalf of the Canadian Press, an organization owned by over 100 Canadian newspapers.

The news database sub-market is currently quite small because the databases are used by specialists as a business information research tool. Real growth in this sub-market is dependent upon use of such databases by business firms at large, and finally by the individual consumer. Infomart claims that the "Electronic Publishers" will have a major role to play in the creation of this mass consumer market, and that Telidon, operating in the "Gateway" mode, will be the key access tool.

## 10.5 The Mass Consumer Market

The Canadian mass consumer market is currently at an embryonic stage. Project Grassroots (Appendix E), operated by the Manitoba Telephone System and Infomart, is the only commercial service currently being offerred to this market. A number of Telidon field trials are underway or planned (Appendix E), but these are unlikely to be succeeded by significant commercial operations

before late 1983 or 1984. The Source and Compuserve Inc. have a small Canadian clientele, but no information is available regarding the size of their Canadian subscriber base and usage.

Many service suppliers seem to be acting on the assumption that this market will become an important one before the end of the 1980s. They include the telephone and cable television companies, who see themselves as suppliers of Telidon based services to this market, especially to the home. On the content side, the most significant Canadian entrant in this market is Infomart, a subsidiary of Southam and Torstar. Infomart defines its business as "Electronic Publishing", i.e. the use of computer/communications systems to distribute information and transactional services to mass audiences.

Both the Department of Communications and Infomart have been pushing the Telidon system and Telidon-based services as an answer to the problem of penetrating the mass consumer market. Some early estimates of Telidon penetration suggested that 500,000 terminals could be in use by 1985. In the light of the British experience with Prestel and experience with the Canadian field trials, these estimates are now acknowledged to be overly optimistic. The uncertainty lies on the demand side, rather than the supply side. There are no reliable estimates of the size of the mass consumer demand for such services, the types of services demanded, and the price elasticity of the demand.

## 11. FLOWS OF PUBLIC INFORMATION SERVICES

(1) With the exception of credit and certain financial information, much of the information contained in these online databases tends to be in the public domain. Trade in packaged databases and retrieval services is therefore more likely than trade in the raw data. One should distinguish, however, between the importation of machine-readable databases by a vendor (like I.P. Sharp, or CISTI) who then builds a public information service around the use of the database, and the direct importation of online information services by end users. Importation of databases by the vendor may be inevitable in many instances, given the relative weakness of the Canadian content creation and publishing industries. Direct importation of services by the end user has a greater impact on both the balance of trade and the markets available to Canadian vendors.

(2) U.S. information producers and vendors would, in general, enjoy economies of scale compared to their Canadian counterparts. The vendors also benefit from generally lower computer equipment and telecommunications costs, which form an important part of the total costs of public information services. It is, therefore, easier for a U.S. vendor to serve selected portions of the Canadian marketplace using a computer facility located in the U.S. than vice versa.

(3) The reference database area has a high proportion of imports, both with respect to databases and services. Nine of the 18 databases offered via CISTI's CAN/OLE and CAN/SDI systems are produced outside Canada.

Moreover, retrieval services provided via the U.S. search services, especially DIALOG and SDC, are heavily used by Canadian libraries. It is important to remember, however, that the total size of this sub-market is quite small, perhaps $5-7m. Even if 80% of the services in this area are imported, rather than the 60% assumed in Section 9.2, this would result in a negative trade balance of only $4-5.5m. No information is currently available about the rate of growth of imported services in this area.

(4) Given the existence of CANSIM, Canadian users are unlikely to make major use of U.S. socio-economic databases for information retrieval purposes, although the services of vendor firms such as DRI could be used for economic forecasting and modelling. Due to the activities of I.P. Sharp Associates, which derives two-thirds of its total revenues (some $24m in 1980/81) from exports to the USA, Europe and the Far East, the balance of trade in this sub-market could very well be positive at this time.

(5) Stockbrokers and financial analysts, on the other hand, must make continuous use of online information regarding the activities of the major American exchanges, provided by vendors like Quotron and Dow Jones News Retrieval, but this type of activity is a condition of doing business and this application has many of the characteristics of a closed user group. No data are available, but it is quite likely that currently imports far outweigh exports of services in this sub-market.

(6) Credit databases are a major area of potential concern, because of privacy and sovereignty as well as economic considerations. We suspect that much personal data on individual Canadians, collected by credit card companies and financial services, is held in U.S. databases which support the North American or even worldwide operations of these companies. Examples would include VISA, Mastercard and American Express operations, as well as those of finance companies like Household Finance. In this area, privacy and sovereignty considerations may become more important than the purely economic issues related to importation of services.

(7) Canadian users are unlikely to make major use of U.S. legal databases, and vice versa. On the other hand, it is quite likely that U.S. news databases, like the New York Times Information Bank and the Dow Jones News/Retrieval Service, are more used in Canada than InfoGlobe is used abroad. The balance of service flow in the news sub-market is probably negative. This sub-market is small now, but could become important in the future if full text news databases win mass consumer acceptance, and are delivered via Videotex/Telidon services operating in the "Gateway" mode.

(8) While reliable estimates are not available, it is possible to speculate that the overall balance of trade between Canada and the U.S. in packaged databases and information services lies in the favour of the U.S. However, the problem should be viewed in its proper perspective. The size of the Canadian market for Public Online Information Retrieval Services is currently quite small; some $20 - 45m in 1980. Even if 60%

of the total market was served by imports (and this seems to be a high figure), the negative trade balance would still be only $12-27m. This is only 3-5% of the $530m of EDP services estimated to have been imported by Canadian users in 1980, mostly through intra-corporate transactions between parents and subsdiaries of multinational enterprises (DOC Growth Model, Revised Estimates). The negative balance in public information services would be comparable, however, to the estimated positive balance of trade in computer services purchased from the computer service industry. For 1980, the Growth Model assumes service supplier exports of $60m and imports of $30m, for a positive balance of $30m. There is, however, the problem of double-counting the revenues of service suppliers like I.P. Sharp in making the above comparison.

## 12. INDUSTRY CONCERNS/VIEWS

Industry concerns will be divided into two groups: those voiced by information producers (all the ones interviewed were public agencies), and those voiced by database vendors, both public and private.

### 12.1 Information Providers/Producers

The two organizations interviewed, Statistics Canada and Environment Canada are both information providers and producers. In one case the data is produced as a part of the agency's primary mandate, while in the other it is an important byproduct.

The primary concern of both agencies is the widest possible dissemination of the information produced. The CANSIM division of Statcan has tackled the problem by housing its CANSIM Main Base at one host service bureau, and making a standard subset of the data, the CANSIM Minibase, available to a number of Canadian and foreign vendors, for a relatively modest annual fee of $20k (Appendix C). Environment Canada has chosen to house its WATDOC group of databases at a single private Canadian vendor (Appendix B), but also makes some of the data available through an international database sponsored by the Food and Agriculture Organization, the Intergovernmental Commission of UNESCO and the Ocean Economics and Technology Office of the United Nations Department of Economic and Social Affairs.

Cost recovery and payback considerations can create a major conflict of interest for the public information producer. On the one hand, the producer

may find it highly desirable that data produced with public funds be made accessible to Canadian users via Canadian vendors. But if Canadian market demand is insufficient, in a particular case, to make the database financially viable, the producer may have to subsidize a private vendor by absorbing a portion of his computer and storage costs. A U.S. vendor, operating in a larger market, may not need such financial support and could also provide wider access to the data. The Canadian producer is therefore left with the choice of subsidizing the Canadian vendor, or making Canadian data produced with public funds available to a U.S. vendor for distribution in Canada at no cost to the producer. There are no guidelines to cover this situation when it arises.

## 12.2 Database Producers/Vendors

All the private database vendors interviewed were opposed to any TBDF policies or restrictions which could affect their ability to offer their products and services outside the Canadian market. This view was expressed most strongly by I.P. Sharp Associates Ltd. and InfoGlobe. Both these companies have products/services which are competitive in international markets (see Appendices B and D). They see an integrated North American market for their services, made possible by the integrated Canada/U.S. telecommunications network, combined with important actual or potential markets in Europe and the Far East.

I.P. Sharp Associates, which already does a large volume of business in Europe and the Far East, noted with concern the increasing telecommunications costs of serving these markets with computer facilities located in Canada. Outside Canada and the U.S., the rise of public packet switched networks seems to be accompanied by a trend towards sharply increased tariffs for leased

private lines. Such a development would increase the costs of the private data networks (packet switched or otherwise), which are offered by vendors like Sharp, DRI and GEISCO (Appendix A), to the extent that they may no longer be competitive with the public data networks. Although the costs of the telecommunication network are absorbed by the vendor, they must ultimately be passed on to the user in the form of higher access charges, either accross the board or differentially for users outside North America. If this trend develops, a North American vendor may be forced to locate computer facilities in Europe, in spite of the extra cost of duplicating and controlling databases at multiple computer sites, to remain competitive in the European market. The situation is further complicated by access restrictions for U.S. (and Canadian) database vendors to the Euronet DIANE network.

All the database vendors interviewed insisted that they must be free to import databases produced outside Canada, and offer them to both Canadian and non-Canadian users of their services. This is seen as an essential requirement in serving both the Canadian and foreign markets, because a large proportion of the data demanded by the users is produced outside Canada.

In addition to these global TBDF-related concerns, others were expressed which were specific to particular vendors. One private vendor claimed that competition from publicly funded agencies (federal or provincial), often operating on a less than full cost recovery basis, served to reduce the market effectively available for private vendors. This has not been a concern as yet in the source-numeric sub-market. In this context, it should be noted that the Office of Management and Budget of the U.S. federal government has (in a memorandum dated September 11, 1981) requested all government departments and

agencies to determine whether federal information centres or activities duplicate private endeavours or pay their own way.

Concern was also expressed by database vendors that the federal government is involved in database activities in-house which the private sector is able to provide. It was felt that, at the least, the federal government could apply its "make or buy" policy more rigorously in this area.

Another vendor expressed the view that the Department of Communications may be overemphasizing Telidon as an information delivery technology, to the detriment of other established and developing technologies for distributing public information services. It was pointed out that the Telidon data structure, built around the concept of the "page" and the tree-search, was neither necessary, or even particularly suitable, when it came to dealing with conventional source numeric, source full text or reference databases. The transactional and gateway capabilities of Videotex systems were, however, seen as two very important factors in wider use and spread of this type of public online information service.

## 13. USER VIEWPOINTS

The interests of the end user are not necessarily the same as those of the Canadian supplier (information producer or online vendor), and must be kept in mind when considering trade in, or importation of services. The user requires appropriate information, at the least cost, to improve his efficiency and productivity; if this is not available from a Canadian supplier, he will go to a foreign one. In many cases the gains to the user, in terms of improved efficiency and productivity, may far outweigh the loss to Canadian suppliers, represented by the importation of the information service.

Time and resource constraints of this phase of work of the Task Force did not, unfortunately, permit for a survey of user's views on access to information in the context of TBDF. The only users that could be readily contacted during this phase of the project were a group of reference librarians in key federal departments and organizations (see Appendix G). All these libraries operate some form of a computer based reference service for their users, accessing both Canadian and U.S. database vendors. The librarians were unanimous in pointing out that access to the U.S. vendors (Dialog, SDC, BRS and NLM) is an essential requirement for the service that they provide to their clients (primarily researchers). Several also expressed the view that it should be left to the information specialists' discretion to decide how a user request could be best serviced, instead of imposing access priorities.

In the context of other forums and studies, users (especially the scientific research community) are quite adamant that access to data or information should not be restricted or hindered in any way.

## 14. ECONOMIC ISSUES

From an economic perspective, an analysis of the public online information services industry presents a number of difficulties:

- The industry forms part of the much wider economic activity based on the utilization of computer/communication/information (CCI) technologies to produce a wide variety of products and services. Therefore, one must first of all discuss the structural aspects of CCI.

- Within its own sector, the public online information retrieval services industry is a subset of network-based services. The latter also includes transaction services. A discussion of this sector and its characteristics is presented below.

- It should be noted that certain issues have an economic as well as a social, cultural, and/or legal dimension. Such issues have been dealt with from these other perspectives in the two succeeding chapters. In this chapter, only the economic aspects will be considered.

- The appropriate role of government in the information industry warrants specific consideration because governments are both the largest single producers and consumers of information.

Consequently, this chapter consists of four subsections:

- structural considerations;
- sectoral analysis;
- role of government in setting the economic environment; and,
- the role of government in the marketplace.

## 14.1 Structural Considerations

CCI-based activities are being increasingly used by business in all sectors of the economy to improve cost-effectiveness and productivity in provision and delivery of existing products and services. In addition, CCI technologies are being utilized to transform or expand existing products and services in a wide variety of new and innovative ways. It should be noted, however, that this use of CCI technologies to provide new or expanded services by industry in many sectors is blurring the definition of sectorial boundaries. This is because the main component of this activity, i.e. computers, communication networks, software and information content, are the same for all the traditional sectors. From a functional perspective, the analogy is one of a factory which has the capability of producing any product imaginable without the need for complete retooling. A bank offering economic intelligence services, a computer service bureau offering cash management, a news agency offering stock quotations and commodity dealing, are differentiated only by the software and information content.

From an analytic point of view one finds CCI activities in each of the existing sectors in the economy. Yet at the same time, this use of CCI,

especially where new products and services are being provided by these vertical sectors, is rapidly generating a major new economic activity which should be considered a sector in its own right but with horizontal as well as vertical attributes.

Since some of the vertical sectors participating in this transformation are regulated (e.g. telecommunications, banks) while others are not (e.g. computer service bureaus, the media, to name a few), this can lead to distortions in the efficient provisioning of new products and services. It also brings sectors which were previously isolated from one another into competition.

The result is that present analytic frameworks for assessing traditional types of economic activities are becoming less relevant. Until such time as an analytic structure or framework is developed which will cope not only with the agricultural and industrial age but also, and especially, with the informatics age, it will be difficult to place electronic network-based activities in general and information services in particular in their proper context.

## 14.2 Sectoral Analysis

The major components of the electronic network-based services sector are information services and transaction services. In the former, the information is the end product desired by the consumer while in transactional services, the information flow is used to facilitate an economic transaction. Currently, transactional services tend to be of the intra-company or closed user group type and have control over their distribution points, which tend to be in

fixed locations. However, information utilities such as Compuserve and the Source are starting to offer transaction-based services, e.g. reservations for theatre, sports and travel, online ordering of goods, etc.

The public online information retrieval services industry is but one sub-component of online information services. Its distinguishing characteristics are that the information provided is almost always in the public domain and that the only criteria for access by the user is the ability to pay. This distinguishes it from online systems serving closed user groups.

The economics of public online retrieval services are based on:

- achieving economies of scale through

    - mass distribution and use; and,
    - having single information distributors offer as many databases as possible. (The fact that a particular database is offered by several vendors is not uncommon.);

- availability of the information content (hopefully in machine-readable form) at marginal cost rather than at full cost of creation. (This means that the majority of the information offered online is basically the machine-readable equivalent of information already available in hard-copy form. It should be noted, however, that both publishers and the press are increasingly creating their information directly in electronic form even if only to generate books, periodicals, newspapers, etc.);

- widespread availability of cost-effective, distance-insensitive telecommunications services for providing access to electronic databases stored in large central computers;

- increasing proliferation of low-cost and intelligent user access devices such as microcomputers;

- the development of more sophisticated and yet more user-friendly retrieval software which eliminates the necessity of both costly abstracting and the necessity of an expert intermediary between the user and the online system;

- increasing computer literacy;

- marked decreases in cost of computers and especially mass data storage devices; and,

- increasing labor costs at all levels are making such services a cost-effective substitute for traditional methods, i.e. human labor intensive, for identifying and retrieval of available information.

## 14.3 Role of Government in Setting the Economic Environment

From an economic perspective, those in the online information industry noted that there were two basic issues of an environmental or policy nature which affect the economic vitality of the industry. The first concerns protection of informatics assets, the second the question of equitable return on informatics investment.

With respect to the first, the businessman is concerned about unauthorized use of his computing facilities (i.e. "theft" of computing services or computing time) as well as unauthorized access to data or the alteration or destruction of data. This pertains to informatics assets which are not meant to be distributed but serve as factor inputs in the production of goods or the delivery of services. Current law and jurisprudence appears to offer little or no protection against unauthorized destruction or theft of informatics assets.

The second area of concern which is hampering investment in the online industry is the question of being able to ensure an equitable return on investment in informatics products and services meant for distribution and sale. The question here particularly concerns copyright protection for computer programs and the content of online databases.

Those offering videotex or Telidon-based products and services, where software and content, i.e. page design, tend to overlap are especially concerned about the current lack of copyright protection.

While the legal aspects of possible amendments to the Criminal Code and Copyright legislation are dealt with in greater detail in Section 16 below, the apparent lack of legal protection for informatics assets and investments is an economic issue because the lack of legal protection inhibits investments in the online industry.

It should be noted that the federal government is sensitive to these concerns. The Department of Justice has launched an initiative to amend the Criminal Code with respect to computer crime and data abuse. In addition, a

White Paper on Copyright paying specific attention to copyright problems associated with software and information stored in electronic or digitized form is being prepared.

## 14.4 Role of Government in the Market

### 14.4.1 Supply Side

As stated earlier, government is the largest single producer of information in most industrialized countries. This information is usually collected for operational purposes, i.e. program delivery and evaluation, collection of statistics by StatsCan and other agencies, etc. In addition, government undertakes and funds a broad variety of research which also involves the collection and analysis of various types of data.

A substantial portion of this information is or could be in the public domain and is increasingly being processed in machine-readable form. As such, it forms the feedstock for online databases, some of which are distributed by government agencies, e.g. CISTI, and others by the private sector, e.g. CANSIM.

However, much of the information which could be made public is not provided in a form suitable for direct input into online databases. The economic issue here is whether government should incur the marginal cost of providing such information in suitable form for use by the private sector in building up the online industry.

Recently, the government has further entered the online database industry by providing access to information free of charge. Not only is such information in the public domain but access is free and thus the economic barrier of ability to pay has been removed. This is because the content of such databases is deemed to be of universal interest and usefulness and their provision is deemed to be a component of government service to the public. CANTEL and Teleguide are examples of such public use online retrieval services.

It should be noted that there are two economic issues related to the government's supply side activities. One, the federal government, as well as most provincial governments, have a general "make or buy" policy for the procurement of goods and services. For the federal govenrment is is not clear whether its "make or buy" policy is being applied to the area of online information services, i.e. creation, processing and distribution of information, on a fully costed basis. Certainly the prevailing view in the private sector seems to be that is is not.

This raises two sub-issues. On the information creation/processing side, the government is undertaking a wide range of activities in-house which the private sector feels should be contracted out. On the information distribution side, the private sector feels that the government is distributing information at less than the full cost of providing such services, both for its in-house needs and on the open market. Both private sector database/ distributors and information brokers feel practices of this nature constitute unfair competition and hamper their growth.

Secondly, there has been debate for sometime as to whether government information in the public domain should be provided in electronic machine-

readable form at a cost less than its full commercial value. More commonly known as the "for free or for fee" debate, discussion of this issue has become quite keen in the U.S.

14.4.2 Demand Side

Whereas the supply side deals mainly with the provision of information by government, the demand side deals with the purchase or use of information by government. The two main purchase operations seem to be subscriptions, which may or may not be in electronic form, and retrieval of information from electronic databases either via departmental librarians or directly by end users.

Economic issues arising from the above are:

- whether information readily available is used sufficiently for projects and programs;

- whether the use of existing online services in the various departments can be rationalized through a common service approach. Examples would be a centralized approach such as CAN/SDI, or the development of specialty centres or government-wide specialists for specific areas and/or databases;

- whether the expanded role of reference librarians in providing in-house online information retrieval services introduces both an element of unfair competition to private information brokers and lack of price sensitivity for purchase of "unique" information on a demand basis.

It should be noted that until recently, a library represented a fixed investment in a pool of information (i.e. books and journals), equally available to all users and reusable. Any abstracting or selection was done by the individual user but did not add to the cost of the library. Online information retrieval services allow the user to save his/her time and efforts. However, this introduces a variable cost for information which does not add to the general pool. The question then becomes whether the cost of this information should be borne solely by the user or operational area requiring it, or be carried as part of the general overhead embodied in the library function. If the former, the question of whether government demand for electronic information should be met through in-house or open market information brokers on a competitive basis becomes one of economics.

### 14.4.3 Industry Support and Stimulation

Traditionally, governments (both federal and provincial) have supported the creation of information albeit in hard-copy form, (e.g. paper, film, etc.). By reducing the cost of information creation and its distribution, government has significantly lowered the economic barrier to information acquisition or use by the general user, and may thus help to stimulate demand. Consequently, measures of industry support or distribution subsidization are interlinked and could have as common aim as wide a distribution of indigenous information products as possible.

From an economic perspective, the question arises as to whether current government support/stimulation measures for the creation and use of information in hard-copy or broadcast form can or should be extended to the electronic

online information retrieval industry. Is the nature and structure of the industry such that it requires new and different measures, if government wishes to encourage its growth and ensure its vitality? Insofar as this issue is linked to "cultural industry" considerations, the Report on Cultural Sovereignty (Ref. A18) reviews traditional government support measures for areas such as book and periodical publishing, films, music etc. and via granting councils such as the Canada Council, etc., in light of the new information technologies.

In addition, information is an economic asset and its effective use may have a bearing on the improvement of industrial productivity, innovation and competitiveness (both domestic and international). The question arises whether government should support the creation of databases deemed to be either in the "national interest", of specific utility to a certain existing industry sector or enhance the international competitiveness of the Canadian online information industry. Examples of measures in these areas taken by the EEC have been given in Chapter 9.

Domestically, the government sponsored Record Catalogue supports both the online industry (à la Telidon) as well as the Canadian record industry.

The economic strategy of smaller industrialized countries is often based on identifying and exploiting market niches. With respect to multinational corporations, this strategy is expressed through the concept of world product-mandates. This raises the prospects of a strategy for the online industry, one of whose elements might be the production in Canada of online databases in areas of special Canadian expertise, which are of domestic economic interest and which offer the likelihood of a world product niche. Such areas could include northern research, environmental pollution, silviculture, geoscience, etc.

## 15. CULTURE SOVEREIGNTY AND TRANSBORDER DATA FLOWS

Public online retrieval services are more than just value-enhancing data processing services, these services with their databases have a cultural dimension as well. While general cultural aspects and sovereignty in the context of TBDF are discussed in another report (Ref. A18), there are a number of specific questions which should be addressed here.

### 15.1 Cultural Exports and Imports Act

Current Canadian policy on the import and export of culture (artifacts, documents, etc.) is set forward in the Cultural Property Exports and Imports Act. However, this act applies to hard-copy records only and not to those in machine-readable form. Further, the act applies only to records which are over 50 years old. Consequently, the act has no relevance to the question of ensuring an electronic archival or cultural heritage. There have been occasions where Canadian databases or database activities, i.e. those with primarily Canadian content or Canadian focus, have have become submerged or swallowed up into larger databases existing elsewhere.

The question here is two-fold:

a) as artifact and information merge into one electronic digitized form, with an age factor being a rather meaningless concept, should or can principles embodied in the Cultural Property Exports and Imports Act be applied to the machine-readable or electronic data?

b) are databases or data banks to be considered cultural entities? Are there certain types of databases which are considered to be "culture free", i.e. scientific or technical, and others, which are heavily culturally weighted, i.e. social sciences and source databases? Is it possible or will it be a useful exercise to identify, classify or grade data banks as cultural entities of note?

## 15.2 Cultural Industry

The Canadian government has always been actively involved in the maintenance of a cultural industry be it in the form of support and stimulation through various grants and research programmes, through regulations put forward by the CRTC or through various tax measures such as those relating to film making (Canadian Film Development Corporation) and Canadian advertising in foreign countries (Bill C-58). No discussions have taken yet place on the desirability or applicability of these mechanisms to databases and data files as a cultural industry. Certain videotex (Telidon) databases could be viewed as art forms as well as information providers. This raises the question of government involvement/support in the creation of electronic art forms as well as the question of whether databases and data files could or should be considered as another (new) sector of the Canadian cultural industry.

A number of current government programs related to the cultural industry should be noted here as they may provide useful analogies.

a) The Art Bank of the Canada Council through its purchase of works of Canadian artists seeks to ensure the viability, development and continuance of an indigenous artist community/industry.

b) The Scholarly Publication Program of the Social Sciences and Humanities Research Council subsidizes the cost of publishing Canadian works of scholarly merit.

c) The Department of Communications has sponsored the creation of a Telidon-based information retrieval service in the form of a data base of Canadian records, hoping thereby to stimulate the Canadian recording industry.

In the creation of both databases and data files, as much as 90% of the total cost lies in creating the machine readable data in the first place. This is also a very labor intensive activity requiring a wide mix of skills. Putting the database up (plugging it into a distribution network) or cleaning and reformatting data files (magnetic tapes) for general distribution represents only 10% of the total costs. Quite often those who create the database or data files do not budget for this 10% since the prime purpose for the creation of machine readable data is to support a certain program activity or research project, e.g. a directory of federally funded research on the disabled as part of Canada's contribution to the 1981 International Year of the Disabled. Even those who feel that their database or data file is of general interest and can make a significant contribution to our knowledge of Canada are prevented (economically) from distributing this knowledge electronically, either because the distribution of the data is not seen as a commercially viable operation or

those who supported the creation of the data do not have either the financial resources or mandate (or desire) to fund such a distribution.

The question to be raised in this context are, "Is the support of 'electronic' publishing either through on-line retrieval services (databases) or preparation and distribution of data files and their related documentation (magnetic tapes) an activity the government wishes to give consideration to?" and "Is the timing right for such a consideration?"

## 15.3 Inventory of Databases and Data Files

Various mechanisms are currently in place which assist in the identification or inventory of various components of the Canadian cultural heritage. For published works, the requirement of a legal deposit in national and/or provincial libraries ensures that this hard-copy Canadiana in print form is identified, conserved and made accessible (in varying degrees) to all Canadians. This system also promotes a positive form of TBDF from the Canadian point of view, allowing those in foreign countries to ascertain quite readily what Canada has to offer in books, periodicals and near-print literature.

The Telidon project of the Department of Communications for Canadian Records fulfills a similar function for the records industry. Other efforts of note are the project of National Museums for a comprehensive Canada-wide computerized inventory of artifacts and a similar project for films by the National Film Board.

There are no such concerted or comprehensive efforts currently being made with respect to what might be termed our "electronic cultural heritage". Nevertheless, two activities currently exist which could provide a basis for the identification and inventoring of databases and data files. These are the COIN Directory of Computerized Information in Canada, sponsored by the University of Alberta and the Automated Inventory of Canadian Machine Readable Data Files, developed by the Machine-Readable Archives Division of the Public Archives of Canada.

The COIN Directory is now in its third edition and has become the most authoritative and comprehensive guide to public databases currently accessible in Canada; it operates as an on-line database at the University of Alberta running under SPIRES software. While not addressing the question of data ownership directly the COIN Directory does identify the source, i.e. the author or organization that prepared the database (See Appendix 2 for a compilation of data on databases and database vendors taken from the COIN Directory and other sources). The COIN Directory is considered the most comprehensive and extensive inventory to date of data bases available to Canadians and being used by them.

The idea of a database of databases or, more precisely, a database of Canadian databases has been advocated for some time both within government circles (e.g. the National Library, the Canada Institute for Scientific and Technical Information (CISTI), DOC's Telidon Project) and in the social science/ research community as well. However, to date various initiatives have consisted of one-shot projects or continuing efforts in a single subject area only. While the COIN Directory lacks information which would be especially useful for

analysis from the TBDF point of view, modifications to its program appear to be the most effective and cost-beneficial approach to the establishment of an on-going, online database on databases accessible to or being used by Canadians with as a sub-set a database of Canadian databases. Criteria for defining the latter need to be refined and will require further consultation with industry and affected institutions and individuals. The establishment of an optimum and mutually beneficial working relationship between the public and the private sector also warrants some attention.

The Automated Inventory of Canadian Machine Readable Data Files is a one year old project of the Machine Readable Archives Division of the Public Archives of Canada. It is an inventory of machine readable data files (magnetic tape) known to exist in Canada. Comprising information on well over 5,000 data files, the inventory has information on data files existing within both the federal government sector (about 3,500) and those in the private and not-for-profit or academic sector (about 1,500). Finally, it should be noted that the Federal Database Group of Statistics Canada maintains a computerized inventory of all federal information banks (hard copy and machine readable) which have to be registered according to provisions of both the Canadian Human Rights Act and Treasury Board Canada regulations.

Proposed Access to Information and Privacy legislation (Bill C-43) will require government agencies to identify their information holdings. Pilot projects (sponsored by the Treasury Board, Statistics Canada and the Public Archives) are currently underway which address specifically various aspects of the application of Bill C-43 to machine readable data. Consequently, there exists a real possibility that an inventory of Canadian data files at least

those pertaining to federal government entities will become an on-going activity and reality. With respect to including non-federal government data files in the inventory, further discussions with the Public Archives and various data archives (public and private sector) across Canada would be in order. (The Public Archives has had, for some time, the creation of a Union Catalogue of Machine Readable Data Files as a long-term objective. Perhaps similar work by the Museums Canada and the National Film Board can provide some guidance in this respect).

Only with an up-to-date database on Canadian databases and databases accessible to Canadians and an Union Catalogue of Machine Readable Data Files will it be possible to analyse and identify supply trends in machine readable data both as a cultural industry and cultural heritage. Such information is a prerequisite for being able to gauge both the qualitative and quantitative aspects of TBDF as they relate to databases and data files so that the government may be able to identify specific problems and take remedial or stimulative actions when appropriate.

## 15.4 Courseware or the 'Electronic Textbook'

Already in the early 1970's computer-assisted learning (CAL) or computer-assisted instructions (CAI) was introduced at major universities but it was not until the advent of the microcomputer in 1980 that the use of CAL spread to the elementary and secondary schools. It has already become apparent that 'electronic textbook' or courseware in use in Canada suffers from a lack of indigenous materials. While the question of the "Canadian Context" may have

little relevance to the learning of arithmatic or chemistry, it definitely is relevant to the study of most subjects in the social science. Various studies by the Science Council, Ministries of Education, Task Forces at different levels and committees of school boards seem to be unanimous that there is a dearth of Canadian courseware.

While these questions require further discussion in other more appropriate form, it may be noted that from a TBDF perspective the dearth of indigenous courseware does lead to a chronic reliance on foreign sources low in Canadian content. This not only has a negative impact on our trade picture (especially if microcomputer useage continues its widespread penetration of the educational and mass consumer markets) but an overwhelmingly one-way inflow of culture sensitive courseware is not healthy development.

## 15.5 Cultural and Economic Dependency and Transborder Data Flows

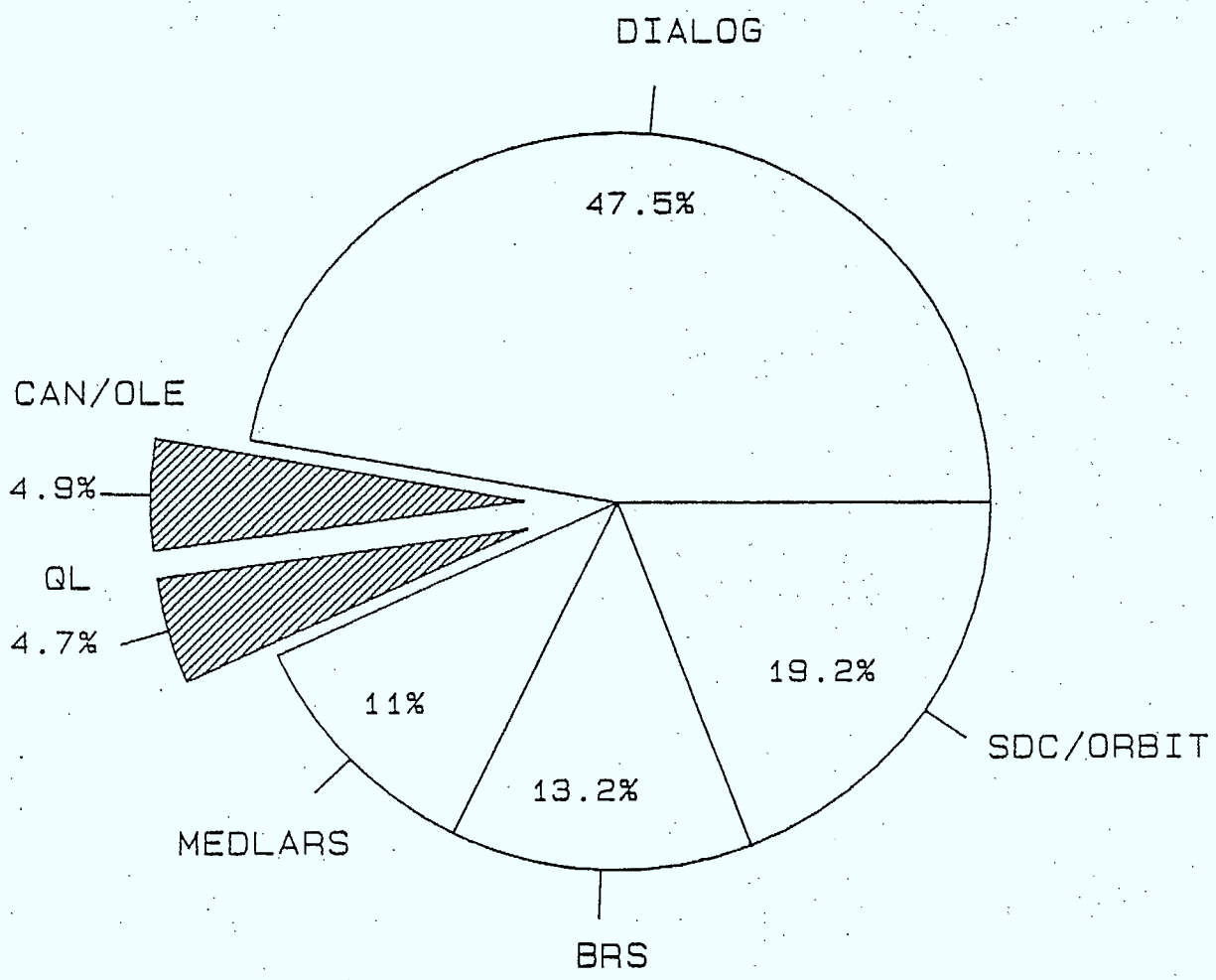
Very little hard data is readily available which would make it possible to discern the cultural impacts of transborder data flows involving public online information services. Criteria are lacking for evaluating what databases are relatively culture free and which have a high culture content. (Some would even question the validity of such an undertaking). The Task Force Report on Cultural aspects provides an initial analysis of the "electronic culture" question.

It must be noted that many of these databases cannot really be considered to have a cultural component. Nevertheless, survey data that is

GRAPH 15.1

PAYMENTS BY POST-SECONDARY INSTITUTIONS FOR PUBLIC ON-LINE INFORMATION SERVICES, 1979 *

(AS % OF EACH $1 OF REPORTED PAYMENTS TO MAJOR SUPPLIERS)




CANADIAN SUPPLIERS

* LAWTON, STEPHEN B., "DIFFUSION OF AUTOMATION IN POST-SECONDARY INSTITUTIONS", CANADIAN LIBRARY JOURNAL, APRIL 1981, PP. 93-97.

available does indicate a heavy dependence on foreign data bases (mainly U.S.) by Canadians. A survey by Gilles Deschatelets (1979) on online search services centres, indicated a clear domination of U.S. databases and U.S. vendors. His findings showed that of the 380 online service centres surveyed availability of online systems at these service centers was:

(Top Five Systems)

| | | |
|---|---|---|
| ORBIT | - 24.5% | (U.S.) |
| CAN/OLE | - 17.7% | (CDN.) |
| DIALOG | - 17.4% | (U.S.) |
| QL SYSTEMS | - 14.0% | (CDN.) |
| MEDLINE | - 6.3% | (U.S.) |

These figures indicate that ORBIT, a U.S.-based service marketed in Canada by Informart Ltd., has the highest market penetration being available at 24.5% of the online service centres surveyed.

According to Deschatelets in terms online systems usage, the top four systems were:

| | |
|---|---|
| ORBIT | - 35.9% |
| DIALOG | - 27.1% |
| CAN/OLE | - 22.9% |
| QL SYSTEMS | - 14.1% |

A ranking of most frequently queried databases by Deschatelets shows that the top ten databases were all non-Canadian. They are, in ranked order:

| | |
|---|---|
| 1. COMPENDEX | 6. BIOSIS |
| 2. CHEMLON | 7. PSYCH. ABST. |
| 3. NTIS | 8. MEDLINE |
| 4. INFORM | 9. INSPEC |
| 5. ERIC | 10. MANAGEMENT |

Another study by Stephen Lawton in (late 1979) on online retrieval in post-secondary institutions also noted that the top ten most searched databases were non-Canadian. Lawton gathered some preliminary data on payments made to online systems and while the figures are tentative, they do show that out of each $100 spent on public online information retrieval services in the post-secondary institutions,

| | |
|---|---|
| DIALOG (U.S.) received | - $47; |
| ORBIT (U.S.) received | - $19; |
| BRS (U.S.) received | - $13; |
| MEDLINE (U.S.) received | - $11; |
| CAN/OLE (CDN.) received | - $ 5; and |
| QL SYSTEMS (CDN.) received | - $ 4.7; |

These findings are presented in a pie chart as Graph 15.1

This would lead to a tentative conclusion that, at least in the reference database sub-market of online information retrieval services, Canadian dependence on TBDF for delivery of this service could be as high as 90%.

A recent U.S. survey by Advanced Technology Libraries of 50 public academic and special libraries (including two Canadian) that subscribe to

on-line services found that the distribution of subscriptions to on-line services was as follows:

| | |
|---|---|
| DIALOG | - 92% |
| SDC | - 58% |
| BRS | - 54% |
| NY Times | - 30% |
| Medline | - 24% |

In terms of databases accessed the top ten in descending order were

ABI/Inform

Medline

Psy. Info

Chemical Abstracts

Management Contents

Compendex

NTIS

Magazine Index

Predicarts

Information Bank (NY Times)

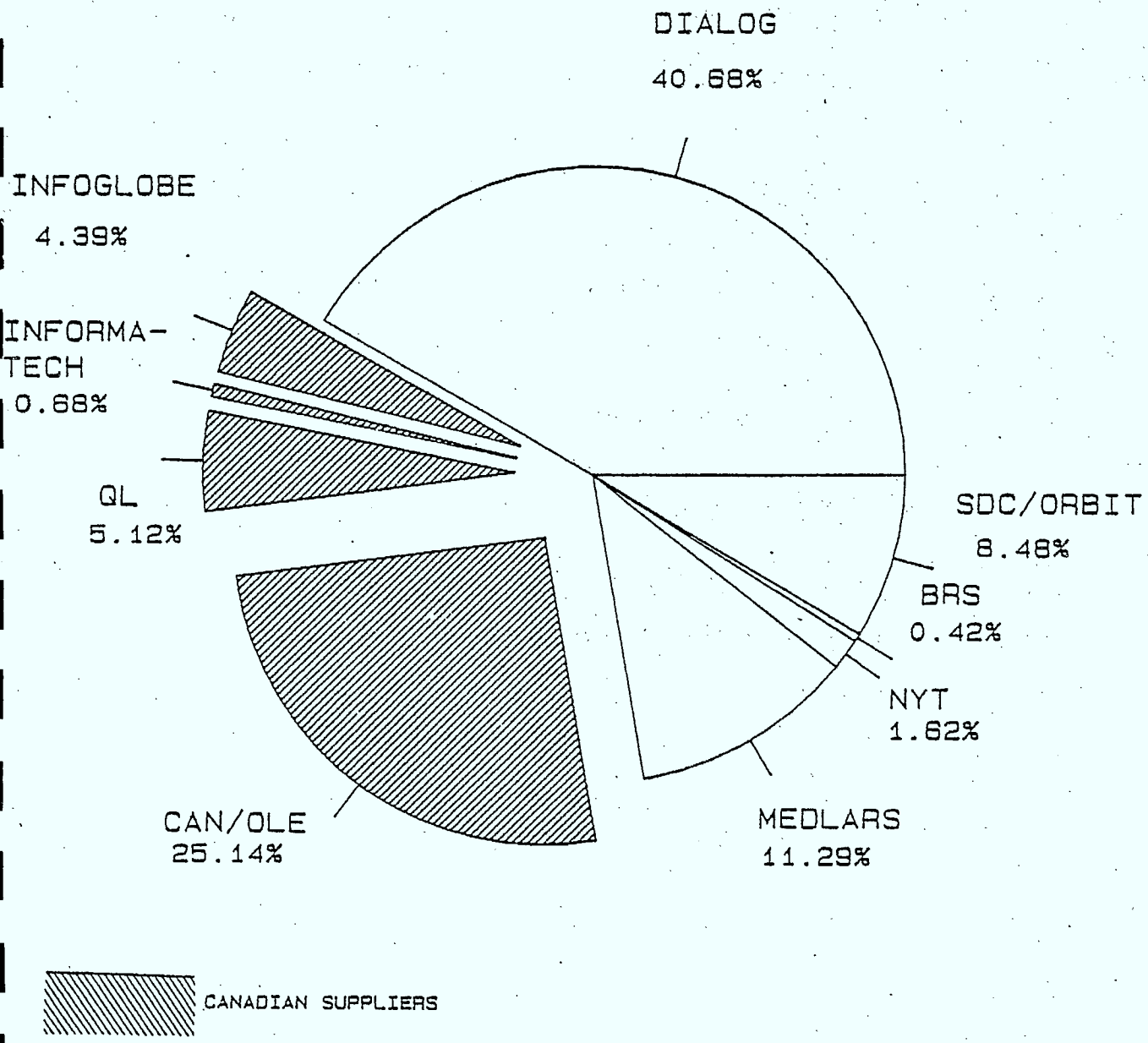
Typical monthly bills for on-line services averaged $1600 for corporate/special libraries, $1300 for academic libraries and $600 for public libraries.

A sampling of a select number of major federal libraries on their use of online services yields an additional insight into usage and flow patterns.

GRAPH 15.2

PAYMENTS BY KEY FEDERAL DEPARTEMENTAL LIBRARIES FOR PUBLIC ONLINE INFORMATION RETRIEVAL SERVICES, 1980/81*

(AS % OF EACH $1 OF REPORTED PAYMENTS TO MAJOR SUPPLIERS)




* BASED ON APPENDIX G, KNOPPERS & NEOGI, REPORT ON PUBLIC ONLINE INFORMATION RETIEVAL SERVICES, INTERDEPARTMENTAL TASK FORCE ON TRANSBORDER DATA FLOWS, 1982.

One is a ranking of the top ten services according to the number of connect hours, the other a ranking according to monies spent on using the services.

The detailed tables and methods used for tabulation are presented in Appendix G. Basically they indicate that out of each $1 that federal institutions spend on online information retrieval services about 35% is spent in Canada and 65% in the U.S. In addition, of the 35% about 71% is paid to the federal governments own CAN/OLE system. This would mean that out of each $1 of federal funds spent on online information retrieval services only $.10 goes to the private sector. The results are summarized in a pie chart in Graph 15.2.

Preliminary analysis of the databases available and accessed by Canadians (Appendix I) indicate that sources of unique reference and bibliographic bases are

| | | |
|---|---|---|
| Canada | - 35% | |
| U.S. | - 56% | (out of 288) |
| England | - 5.7% | |
| Netherlands, France and Switzerland | - just under 1% | |

And similarily for source-numeric data bases, the origins are,

| | | |
|---|---|---|
| Canada | - 66%* | |
| U.S. | - 28% | (out of 68) |
| England | - 4½% | |
| Austria | - 1½% | |

(* I.P Sharp is the major factor here).

## 15.6 Cultural Identity and Sovereignty

It has been estimated that about 3% of the world's research is done in Canada (this is not that disproportionate considering that Canada, with its

heavy dependence on trade, accounts for about 5% of the total world trade). Consequently, there is a built-in (economic) motivation to add this 3% of knowledge to the 97% for the purpose of data base creation and global dissemination/ distribution purposes. This is not a unique situation and could be considered the norm looking at other sectors of Canadian culture.

In the public on-line retrieval sector, one could work towards proportional equality and reciprocal sharing. Several possibilities exist.

### 15.6.1 World Product Mandating or Specialized Missions

In order to ensure a larger degree of reciprocity in international trade, to encourage a larger degree of independent action and flexibility as well as a more equitable distribution of research and development work, multinationals have in recent years adopted the concept of world product mandates or specialized missions for their subsidiaries in various countries. Multinationals and their national subsidiaries and the host countries view world product mandating as a very practical and realistic approach to ameliorating a number of conflicts that have arisen in the relation of the multinational corporation to the nation state.

A number of data bases are created and maintained in the context of cooperative international arrangements. The motivation for such activity is basically two-fold, namely:

- the need for data base (reference or source) is identified and recognized simultaneously by many nations usually in the context of some on-going joint international activity; and

- individual participating entities (national and/or private) decide that the practical needs of each will be served best by pooling effort and resources in order to build a data base which is as comprehensive (authoritative) as possible.

Examples are databases such as the FAO agriculture database in Rome the IAEA atomic energy database in Vienna and the ILO labor database in Geneva. Participating countries forward their data to those processing centres where the master database is created. One can either access the data base online or receive copies of the up-dated database for distribution on national or other networks closer to home.

In this context, the question is raised whether the federal government and the private sector would find it desirable to identify some possible subject areas for which one may wish to obtain a world product mandate or specialized mission. Such specialized missions in database activities could be linked to vital information needs of Canadian government industry and the research community. Examples which might be considered are those in arctic/northern research, pulp and paper, or telecommunications research. The idea is presented here as a concept only and further research needs to be done on the practicality

and other ramifications of adopting such a strategy should there be consent that the concept has merit. It should be noted, however, that European initiatives in this area are proving to be quite successful.

### 15.6.2 Canadian Identity in Databases

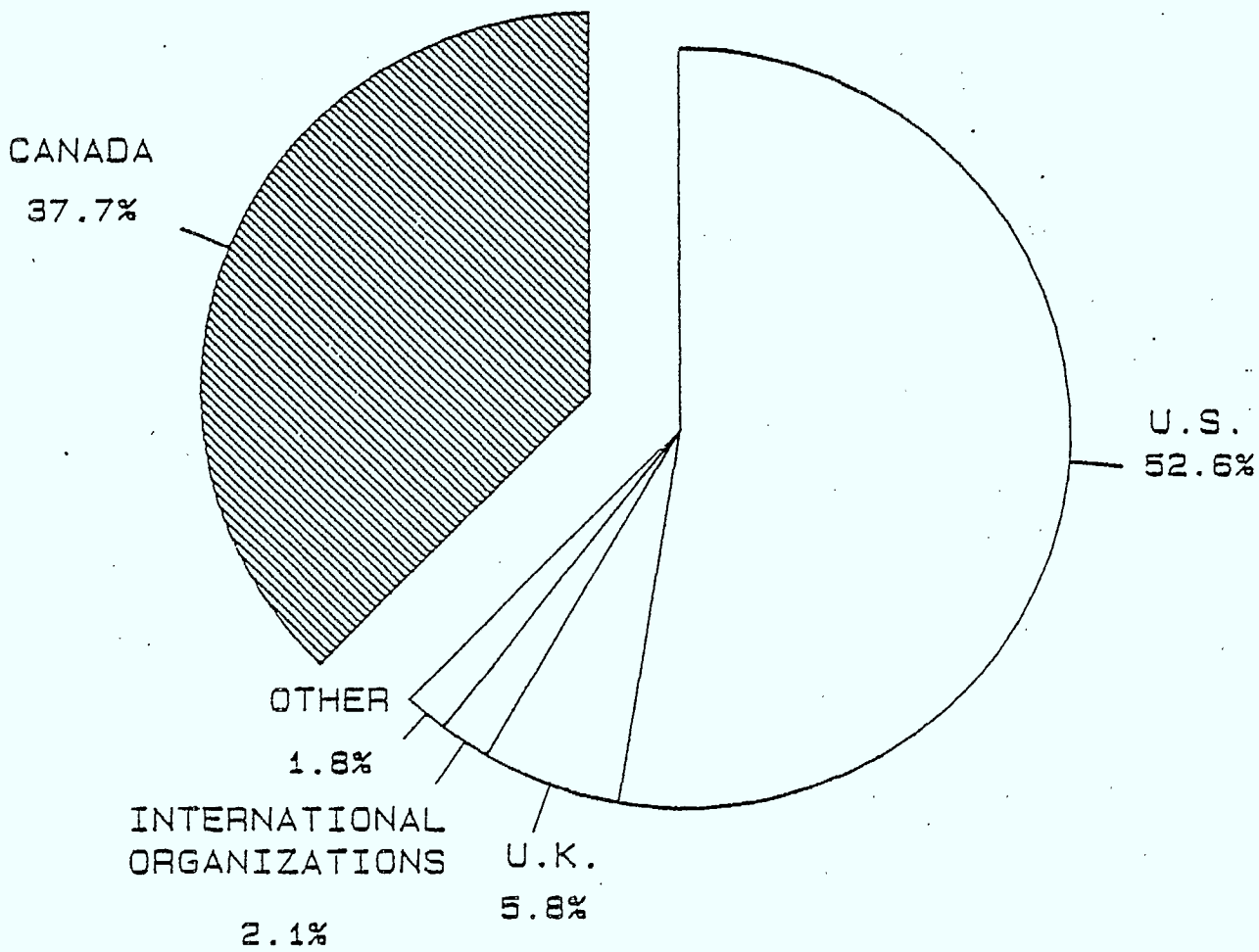
Canadian identity, in terms of Canadian contributions to the content of data bases can be maintained in two ways. Either one physically creates data bases composed of Canadian data or one ensures the existence of a logical "Canadian content" database within a large database. In this section, we address the latter point.

For the most part reference databases focus on a specific subject, e.g. education, toxology, chemical engineering, etc. The purpose of such databases is to capture as much data on a world-wide basis on that particular subject, thereby ensuring a "comprehensive and authoritative" and thus commercially viable database. Queries of scientific and technical databases are usually of an acultural nature, e.g. "What literature is available on the use of barium crystals for low-energy lasers?" But if one queries an international database for non-geographic specific information such as, "What have Canadian doctors written on medical ethics and artifical insemination?" or "What are examples of methodology used by Canadian social scientists to study North-South relations?", it is difficult to obtain an answer. For most scientists the nationality of the author is of little or no concern. Social scientists are not so sure. Given the fact that Canada's bargaining power internationally vis-a-vis public online information retrieval services is of the order of 3-5%, it still may be possible to ensure that the Canadian identity in international database is maintained by

GRAPH 15.3

SOURCES OF REFERENCE DATABASES
CURRENTLY BEING ACCESSED BY CANADIANS
BY COUNTRY OF ORIGIN*

(AS % OF 329 REFERENCE DATA BASES)

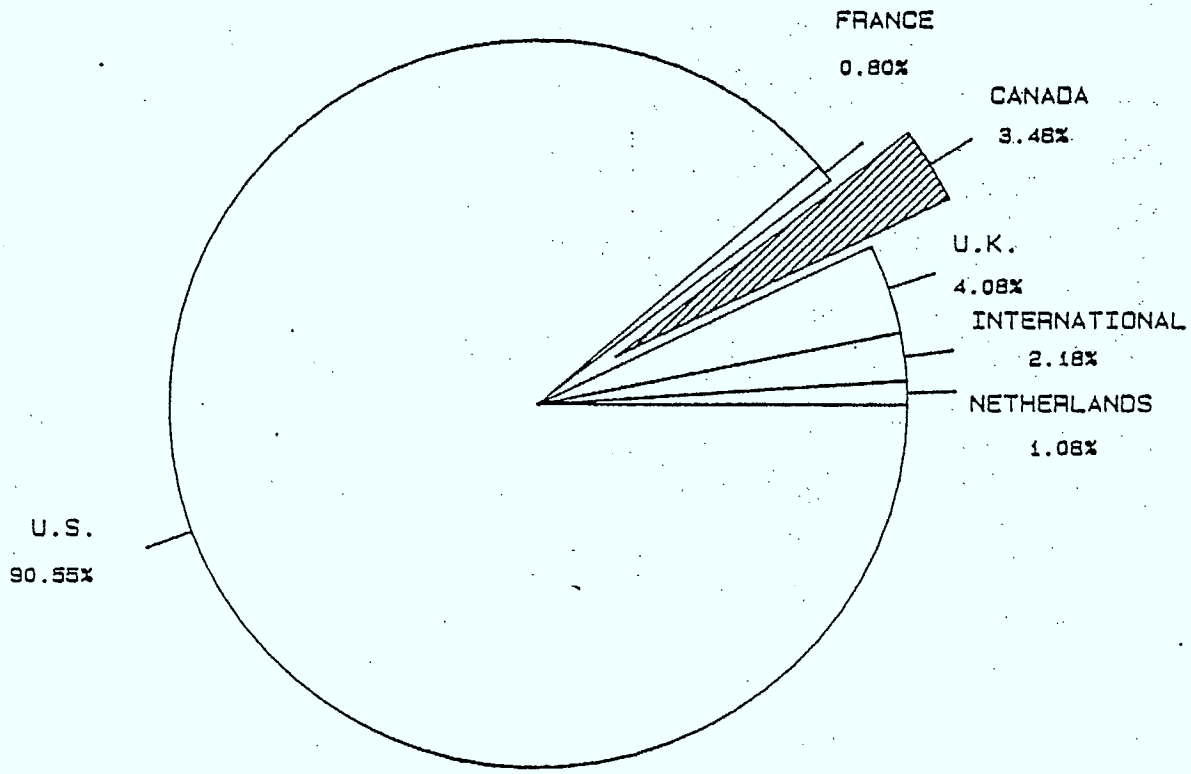



* BASED ON APPENDIX I, KNOPPERS & NEOGI, REPORT ON PUBLIC ONLINE INFORMATION RETRIEVAL SERVICES, INTERDEPARTMENTAL TASK FORCE ON TRANSBORDER DATA FLOWS, 1982.

GRAPH 15.4

DISTRIBUTION OF NUMBER OF RECORDS
(CITATIONS, REFERENCES, ETC.) IN REFERENCE DATABASES
CURRENTLY BEING ACCESSED BY CANADIANS
BY COUNTRY OF ORIGIN*

(AS % OF 12,708,219 RECORDS REPORTED)




* BASED ON APPENDIX I, KNOPPERS & NEOGI, REPORT ON PUBLIC ONLINE INFORMATION RETRIEVAL SERVICES, INTERDEPARTMENTAL TASK FORCE ON TRANSBORDER DATA FLOWS, 1982.

adding a field tag or "flag" to each record identifying the author as Canadian. In this sense, a Canadian identity would be maintained logically in such databases. Once again this is a concept which needs further exploration in terms of both practicality, modes of implementation and costs.

A rather rough analysis of the online databases currently being accessed by Canadians indicates that of the 329 reference databases listed in Appendix I, 124 (or 37.69%) appear to be of Canadian origins. However, these represent only 3.4% of the 12,708,218 records (or references) reported in these 329 databases. The results of these analysis have been summarized in pie chart form as Graph 15.3 and Graph 15.4 respectively.

### 15.6.3 Promotion of Canadian Databases

The federal government has actively promoted creation and maintenance of a Canadian cultural identity through policy and regulatory actions and stimulative measures. Due to the fact, that very little is known as yet on the demand or consumption side of the databases and data files, the discussion here will limit itself to supply-side possibilities only.

A substantial part of research in Canada is supported by public funds (federal government) and in many cases involves the creation of machine readable data. However, in terms of reporting on the products of such research by the researcher, contractor and/or the contracting federal agency, the situation is out of control. The mechanisms to do so are weak or non-existant, i.e. those receiving federal government funds or those dispensing the same for activities which generate databases or data files do not (or are not required) to report on

these products to any information "clearing house(s)". Even where federally funded (research) contracts state that "all material created as a result belong to the Crown", the reporting, retrieval and eventual dissemination/distribution mechanisms for data collected and/or created with the expenditure of (federal) public funds are inadequate.

Of importance to the TBDF issue is the fact that this type of data forms a very unique source for unique Canadian content to reference and source databases. Consequently those creating online Canadian databases (in both the public and private sectors) are deprived of raw domestic input which, if captured or incorporated, would enhance both the economic and cultural value of such databases.

The situation is much the same for data files created either as source data or inventories/bibliographies on a particular subject. In both cases, the downstream economic possibilities for online information services and the possibility of systematic augementation of Canada's electronic cultural stock are lost.

This raises the question of whether a more rigorous and systematic application of current government policies in ensuring that the existence of the research and contract results, i.e. those in the form of machine readable data, resulting from the expenditure of federal funds are made known throughout Canada and the world would faciliate the use of the same as raw data input for the Canadian online services industry thereby promoting some outflows some of which could be profitable or at least revenue-generating.

As in other cultural areas, support is often given for those activities with a high cultural content which cannot survive if left totally dependent on the economics of the marketplace. The same holds true for Canadian databases. As stated above as much as 90% of the cost is in creating the data file while as little as 10% may be the cost of putting the data file up as an online database service thereby ensuring coast-to-coast distribution. Drawing an analogy to both the Aid-to-Scholarly Publications Program of the SSHRCC and industry stimulation programs, (such as those for Telidon, those of DREE and government budgetary tax policies), a number of options or courses of action with respect to database and data file creation as a cultural industry present themselves:

(1) Measures involving Taxation Policy:

Tax Incentives currently exist for individual taxpayers to engage in the production of Canadian movies. There is also the long-standing industry request for different forms of tax relief related to R&D expenditures.

(2) Stimulative Programs

The Department of Communications in an effort to stimulate the development of a Telidon-based industry introduced a one-for-one program. The Department of Regional Economic Expansion provides assistance to establishment of new industry in economically disadvantaged areas.

(3) Direct or Indirect Assistance Programs

The Aid-to-Scholarly Publications Program of the SSHRCC provides financial assistance through subsidizing that part of the publication cost of works of scholarly merit which Canadian publishers estimate would not be covered by market sales. The Department of Communications Telidon database on Canadian Records is an example of indirect economic-cultural stimulation of the Canadian record industry.

In this context, a number of possibilities were noted such as:

(1) The establishment of a fund or program to provide seed money to generate Canadian database activities which either themselves have a good chance of becoming a commercial success or which would stimulate other economic-cultural activities;

(2) The establishment of a fund or program which would assist in the cleaning or reformatting of machine readable data files of a cultural (and academic/research) value thereby promoting their dissemination and distribution; and

(3) The establishment of a fund or program which would ensure that Canadian databases of cultural importance are ensured widespread dissemination and distribution through support of that particular "distribution" expense of the whole activity (i.e. the "10%").

Alternatives such as these were noted as possible measures which would promote the economic vitality and cultural uniqueness of the Canadian online

information retrieval industry. The more unique Canadian products generated, the greater the possibility for exports of data flows since examples of successful new ventures in online information services show that either the unique content or "the most authoritative content" forms the key to successful operations.

## 15.7 Access Protocols and Standards

Questions have been raised as to the possible effect of standard access protocols and dialogue procedures (i.e. U.S., English) for francophone Canadians apart, from a French-language database content itself and how this may tie into official languages policy and language rights under the new constitutional charter. These questions while valid fall outside the domain of the TBDF Task Force. Nevertheless, a number of observations can be made.

a. The systems operated by vendors such as QL Ltd., CAN/OLE, IDRC allow for access procedures and dialogue in either English or French. The problem is therefore less acute for Canadian online information retrieval services than it is for those which are imported and where English is the predominant (if not universal) access language.

b. In the early days of the industry, the use of free text vocabularly and full text data entry was more costly than the use of key words and abstracts. Users were therefore dependent on the language deployed in the keywords and abstracts in defining search strategies. The introduction of full text databases and free text vocabulary with bilingual or multilingual thesauri have brought the

language question back to that of the reference title or document itself. In that sense the computer has become language blind as it works with unique (whole or truncated) character strings. However, a thorough analysis of the interplay of a very strong universal tendency towards the use of English (U.S.) versus an increasing trend towards the use of national languages in terms of access and operating system institutions and the resulting cultural impacts fall outside the scope of the work of this project.

Nevertheless, some recent experience with Telidon (Ref. D11) in this area noted linguistic problems related to:

Error Messages: Even when the user's access protocols and dialogue are in French some of the error messages or the more detailed trouble-shooting manuals are in English only.

Character Sets and Diacritics: Databases often get around the problem of diacritics by using upper case only but even then problems do present themselves as there is a difference between UN HOMME TUE and UN HOMME TUÉ. Further on the data side when using lower case, the entry of French characters with diacritics can require simultaneous combination of data entry keys which is more time-consuming and error-prone (and therefore more costly) than being able to use a "hard wired" bilingual keyboard.

Translation: The possibilities of translation range from word-to-word to literacy translations. For source databases such as full text legal databases this is less of a problem than for reference or source databases which still rely on keywords which often do not lend themselves to an exact translation.

c. The harmonization of standards and protocols in terms of a set of technical specifications and interfaces would allow for the interconnection of online data networks. Presently, communication protocols in the computer industry are proprietory while those in the communication industry are not.

Lack of national standards would hinder the development of national networks while differing standards between nations would,

- affect (hinder) transborder data flows;
- add significant costs to the user;
- foster private/closed networks; and,
- hinder the development of an "open public inter-connect network".

While some of the database vendors of source data operate private networks (e.g. I.P. Sharp), most other database vendors especially those selling reference databases rely on public networks (i.e. the telephone system with DATAPAC, Tymnet, Telenet) for their distribution.

The development, promotion and adoption of appropriate standards are essential to the development of Canadian networks and to its international interfaces. The network's international interfaces are especially important since a high proportion of information and materials used by Canadians come from abroad. In the area of bibliographic control and communication links between Canadian bibliographic centres and libraries, both the National Library of Canada (NLC) and CISTI have maintained substantial standards/guidelines programs. Both institutions have made substantial contributions in the area of MARC format development, ISO Bibliographic Exchange Standards, AACR2, ISBD, ISDS, etc. In December, 1980, the National Library established the formation of a Task Group on Computer/Communications Protocols for Bibliographic data interchange. The work of the Group is directed towards the development of a number of protocols including:

- a File Transfer Protocol;
- a Virtual Terminal Protocol;
- a Common Command Language Protocol; and,
- a Job Transfer and Manipulation Protocol.

The work is being done within the framework of the ISO/CCITT Open Systems Interconnect model.

It might be noted here that The National Library has also recently started a major networking project to test new systems for exchange of bibliographic information taking the approach of the open systems interconnect model, i.e. by participating in Bell Canada's iNet project.

# 16. LEGAL AND INSTITUTIONAL ISSUES

## 16.1 Legal

A decade ago much of the initial work in establishing the online reference databases was carried out by librarians. They identified possible applications for automated support services in providing reference databases. Consequently, many of the reference databases consist of compilations of information that are considered as being in the public domain, i.e. titles of articles, books, reports, etc. In a number of cases, a particular library, organization or institution undertook, as a project, the preparation of abstracts or precis of these publications. The area of coverage of the reference databases usually coincided with the thematic mandate of the library or of the organization which it served.

Concurrently, certain publishers and nascent information companies started developing online databases as a commercial product using both public and proprietary information. The themes or areas of concentration chosen were those which either promised the best commercial viability or those for whose early development someone else (usually a government agency) had provided the initial start-up costs. The net results of the early history of the development of online databases in both the public and private sectors is a melange of property rights with respect to ownership of information in these data banks.

At the same time, no clear dominant pattern has yet emerged in the relationship between information creator, processor, vendor, distributor, etc. In some cases, the vendor buys a database with or without exclusive distribution

rights. In other cases, a database creator pays a processor to build the database and a vendor to distribute it with or without royalty charges. In some cases, the processor, vendor and distributor are the same. Many different combinations of "data ownership" with their ensuring legal complications are possible.

In addition, databases originating outside of the library world (which traditionally does not charge for information) often became part of larger cooperative efforts to establish a larger (more authoritative) database on a specific subject, the arrrangement being covered by no more than a handshake or exchange of letters. As a matter of fact, the concept of "data ownership" has only recently become a real issue now that the industry has passed its initial development stage.

As the online information industry matures, the need for a sound legal framework is becoming more pressing. There is unanimous consent in the industry that the lack of a clear legal framework for data ownership rights is a serious impediment to the development of the industry. Those in the public sector discover that their "hand shake" arrangement in a cooperative venture does not prevent such developments as take-overs now that the database they nurtured has become a (commercial) success.

The situation is less complicated for source databases where one-to-one (database creator/producer to vendor/distributor) relations seem to be the norm. In a number of instances, a single organization performs all these functions. Nevertheless, here also concern has been expressed about the lack of a clear legal framework.

For both the reference and source databases in the public and private sectors, a revised copyright act and amendments to the criminal code are looked upon as the cornerstones of a legal framework for the protection of property rights with respect to data or information. Industry hopes that amendments to the copyright act will address the question of "electronic licensing", i.e. assist in ensuring that just compensation is given for use (or repeated use) and prevent unauthorized "copying" of the information transmitted.

In 1980, the U.S. Congress amended the Copyright Act to specifically include protection for "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result", i.e. software. In August, 1982, the U.S. Congress overode a Presidential Veto to extend the "manufacturing clause" for another four years. The clause which has been in force since 1891 protects American printers by requiring that books written by American citizens be printed and bound in the U.S. or Canada if they are to be given full protection of the U.S. copyright law.

Copyright issues have also arisen for online services with respect to third party users who, employing microcomputers, are downloading records (sometimes in quite massive numbers) from the online files, the first vendor, or online utility that has acted to protect its files is OCLC line of Ohio. In December 1982 OCLC registered its mammoth bibliographic file under U.S. federal copyright. According to OCLC, the decision to copyright was prompted by the utility's "Fiduciary" duty to protect its members' databases rather than any particular unauthorized usage of the central file. OCLC maintains that it is not copyrighting the information within the file, but simply protecting the compilation of the database, i.e. similar to copyrighting on anthology comprised of seperately copyrighted works.

However, it remains difficult to identify specific rights covered by the copyright, such as the right to search the database as opposed to displaying the information.

Those interviewed also stated that amendements to the criminal code should provide legal redress against unauthorized use of computer-communication systems in terms of both access to the data and tampering with the data (addition, deletion or modification).

In TBDF context, the resolution of the question of data ownership rights for electronic or digitized data in terms of domestic law should be carried out with as sub-objective the harmonization of laws addressing similar questions in other countries.

Representatives of the public online information services industry hold strong negative opinions on the question of the use legal instruments such as regulations in relation to TBDF. For the foreseeable future, the possible benefits of regulations will probably not equal a concomitant loss of flexibility in operations and development of new services. Most online information services therefore do not favour (or are against) any TBDF-related regulations which could impact adversely on this flexibility. It should be noted that those operating in the public sector or academic library/information services, while stressing the need for continued availability of access to data anywhere in the world, do see a need for the use of legal instruments as a means for protecting and ensuring Canadian content/culture or a data processing software capability in Canada. (For further details see the other chapters in Section D).

## 16.2 Institutional

Recent changes in the U.S. regulatory environment such as the break-up of AT&T, the cessation of anti-trust proceedings against IBM and the Computer Inquiry II ruling are already affecting the information services environment in the U.S. In particular, the interpretation of "information services" will determine what services the telephone companies will be able to provide. How the question of what is a "basic" and what is an "enhanced" telecommunication service is defined will have a profound effect on the structure and direction of the electronic information services industry in the U.S. Because of the close integration of the U.S. and Canadian networks, the Canadian information industry is bound to feel the effects.

In the U.S., the Information Industry Association has taken the position that legislation is required to restrict the ability of monopoly carriers to transmit information in which they have a proprietary interest and that in those limited situations in which monopoly carriers are allowed to offer proprietary information products, they be allowed to do so only through fully separated subsidiaries.

In Canada, Bell Canada has proposed a reorganization plan in order to separate from their point of view, the regulated telecommunications sector from unregulated services of particular interest. Here, as in the U.S., an example is the approach taken to the "yellow pages", an information services. Under the proposed reorganization of Bell Canada, Teledirect will become a subsidiary of Bell Canada Enterprises.

## E. CONCLUSIONS AND DIRECTIONS FOR FUTURE WORK

### 17. FINDINGS AND CONCLUSIONS

1. Within the limitations of the existing information and data, this report:

   a. defines the Public Online Information Retrieval Services industry and its boundaries;

   b. studies the structure of the industry and segments the market into distinct sub-markets, both geographically and by the type of online databases offerred;

   c. analyzes the relative sizes and growth trends of the various sub-markets;

   d. makes order-of-magnitude estimates regarding the size and growth trends of the market in the U.S., Western Europe and Canada;

   e. attempts to identify the nature and direction of transborder flows in online information services between Canada and the U.S.;

   f. identifies economic cultural/sovereignty and legal/institutional issues of concern; and,

   g. through a series of appendices provides the first detailed overview of various components of the Canadian industry and of databases currently being accessed by Canadians.

2. The report highlights the lack of hard data (usage volumes and revenues, absolute magnitudes and trends) regarding the demand side of this industry generally, and for the Canadian marketplace in particular. Attempts at a further or more precise analysis of Canadian market shares, sub-market growth trends and transborder flows of information services are currently hampered by data availability.

Industry Structure

3. For the purpose of this report, due to the initial time and resource constraints under which this study was conducted, **the public information services industry has been defined to include only the use of public online databases in the information retrieval mode.** Intra-firm and closed user group applications, the bulk of which are carried out in the transaction processing mode, have been excluded for now. Public online information services are thus seen to be only a part of the much larger class of network-based information services activities.

4. The industry consists of five principal groups of players. They are:

   a. the information providers, database producers and database distributors or vendors who constitute the supply side of the industry; and,

   b. the information brokers and information buyers or end users, who constitute the demand side.

Telecommunications carriers play a key support role by providing the data communications networks linking the use workstations (terminals, personal computers, etc.) to the central computers of the vendors. They have been considered as a supplier of services, rather than an integral component of the industry.

Information Suppliers and Distributors

5. In Canada, the U.S. and Europe, governments are the single largest creators of information including that in machine readable form. On the supply side, it should be noted that source data created at public expense forms a major "feedstock" for the information industry and particularly for information retrieval services.

6. Public subsidy, direct or indirect, has played a pivotal role in the development of public online databases. In the U.S., the DIALOG software of Lockheed was developed through a contract with NASA, the ERIC database as a result of service contracts with the U.S. Office of Education. In Canada, QL Systems resulted from the QUIC/Law university research project and QL/Search software was developed as part of a contract for the Department of Justice, while the WATDOC group of databases is being sponsored by the Departments of Fisheries and Oceans and of Environment. The CANSIM database is produced, maintained and updated by Statistics Canada but distributed by a private vendor, namely, IST Inc. Various federal government agencies are also sponsering Telidon-format databases like CANTEL and Telichart.

7. At low marginal extra cost, governments can make source data, already prepared at public expense for their own operational and other purposes, available to industry and the public in a format which encourages a much wider secondary distribution and multiple use.

8. The viability of the Canadian information industry depends on the existence of appropriate distribution infrastructures and markets for its products and services. Currently no mechanisms exist whereby the information vendors as well as users can readily ascertain what machine readable data files and databases are publically available in Canada.

9. While catalogues or inventories exist for manufactured goods and hard-copy information products, no similar national mechanisms exist for computer-based information goods and services. At present there is a greater chance that Canadian buyers of information products and services are more aware of what the U.S. market has to offer, via its well-established distribution infrastructures, than may also be available from a Canadian supplier. The creator of a Canadian information product may therefore, for pure economic reasons, have to use U.S. distribution channels to make Canadian buyers aware of and offer his services in Canada.

## Market Size, Segmentation and Growth Trends

10. The worldwide market in 1981 was estimated at over $1 billion (U.S.) and it is growing rapidly. The Cuadra Directory of Online Databases published in the fall of 1981-82 listed 965 databases, 512 information producers and 170 vendors. Compared to the numbers listed in the same directory a year

earlier there was a 57% increase in the number of databases and a 83% increase in the number of vendors.

11. The market is predominantly a business one and likely to remain so in the medium term. Although mass consumers may eventually become significant users of online databases, this is unlikely to occur until the late 1980's.

12. The market can be subdivided, by online database type, into two distinct sub-markets:

    a. Reference Databases, used mainly by libraries and information specialists, which constitute about 40% of the total number of databases, but account for only some 10% of the revenues to vendors; and,

    b. Source Databases, both numeric and textual, which include Economic, Financial, Credit, Marketing, Demographic, Legal and News databases; these are the ones most heavily used by business firms. Numeric databases are by far the largest sub-market in terms of revenues (some 75% of the total), and one of the fastest growing.

13. On the basis of the supporting telecommunications infrastructure and institutional factors, it is possible to segment the worldwide market into geographically distinct sub-markets such as North America (the U.S. and Canada), Europe (the EEC countries) and the Far East (Japan, Australia, Hong Kong, Singapore, etc). Developing countries presently constitute a very small share of the total market for public online information services.

14. The U.S. domestic market constitutes the dominant share of the worldwide market for public online information services, accounting for an estimated 80% of the total demand. For 1980, market revenues to database vendors are estimated to have been in the range U.S. $600-900 million. The nominal compound annual growth rate for the period 1980-85 is estimated to be in the range of 30-38%.

15. The European market presently accounts for only some 15% of the worldwide demand for public online information services. It is still in its infancy compared to the U.S. market, and the demand for online services is only just now taking off. A Link/IDC study estimated the 1981 market at U.S. $186 million, with an annual growth rate of 25-30% during 1981-1987, giving a projected market size of $570 million by 1987.

16. Online services to the financial and banking sector provided by private networks, principally Reuters, currently account for over 85% of the European market, according to IDC estimates. In the U.S. market, on the other hand, revenues related to Economic, Financial, Stock and Commodity databases currently account for less than 30% of total revenues, while revenues related to Credit, Market Research and Demographic databases account for 30-35% of total revenues.

17. The Canadian market for 1980 is estimated to be 5-7% of the U.S. one, with a range of $20-45 million (Cdn). The nominal growth rate is assumed to be 30%. This would produce a 1985 market size range of $75-167 million (Cdn).

Supply Side Information

18. No sub-market, either geographical or functional, is monopolized by a single company. Each sub-market does, however, have a few dominant firms. Both database production and distribution appear to be characterized by at least some economics of scale and scope, and barriers to entry exist in both these supply functions.

19. The Cuadra Directory of Online Databases, published in the fall of 1981, listed 512 database producers and 170 vendors. Of the producers, 61% were U.S., 10% Canadian and 25% belonged to other countries. Of the vendors, 62% were headquartered in the U.S., 11% in Canada and 27% in other countries.

20. Most public online vendors primarily serve their own national or regional sub-market. The major private North America vendors (all U.S. except for I.P. Sharp) also serve the European and Far-Eastern sub-markets, but there are virtually no examples of European or Far-Eastern vendors effectively serving the North America sub-market.

21. Many of the major U.S. vendors are also the dominant firms in their product sub-market (e.g. Dialog, Mead Data Central). It is quite possible, therefore, that the U.S. share of total vendor revenues exceeds 85%, rather than the 62% share indicated by the mere number of vendors.

Balance of Trade Information

22. The reference database sub-market in Canada has a very high proportion of imports, both with respect to databases and services. The sub-market size

for 1980 is estimated to be $5-7 million with a possible negative trade balance of $4-5 million.

23. Given the existence of CANSIM and the activities of I.P. Sharp Associates, a world class Canadian database vendor, the balance of trade for usage of socio-economic databases might even be positive in the favour of Canada. This may, however, be a transient situation.

24. The balance of trade for full text legal databases may be even, but it is probably negative for news databases.

25. Credit databases are a major area of potential concern, because of privacy and sovereignty, as well as economic considerations. It was not possible to determine in detail, for the purpose of this study which focused on public databases, the Canadian market size or balance of trade for credit databases.

26. The overall balance of trade between Canada and the U.S. in packaged databases and public information services probably lies in favour of the U.S. However, even if imports accounted for 60% of the domestic Canadian market and there were no exports (an extreme scenario), the negative trade balance in 1980 would still have been only $12-27 million.

Canadian Public Online Services Industry Viewpoints

27. The consultations particularly those with industry, vendors, and users on strategies for the Canadian public online information services industry yielded the following suggestions:

a. The policy of stimulating the supply side of the industry is preferable to one of restricting the access of Canadian users to foreign suppliers;

b. Canadian database vendors should be encouraged to compete in the North American market rather than limit their efforts to the small Canadian market;

c. A strong Canadian service bureau industry, fully competitive in the North American market, would provide a firm foundation for database distribution;

d. The legal basis for the industry needs to be clarified so that the "property rights" of data base producers and vendors, can be defined and clarified, i.e. those creating and distributing information should be able to realize a fair return on their investment; and,

e. A well developed domestic market would provide a firm base for Canadian vendors to test their products/services and to build up initial revenues. Demand stimulation measures may be appropriate in this context provided that Canadian vendors are the main beneficiaries of such measures.

28. The major areas of opportunity for Canadian vendors lie in the Source Alphanumeric and Source Full Text database sub-markets. These are also likely to be the major growth areas in the 1980's.

29. The Reference/Bibliographic database sub-market is characterized by a high proportion of imports from foreign suppliers, both in terms of databases and services. It is unlikely that existing Canadian vendors or new Canadian entrants will be able to compete effectively against the major U.S. search services, except possibly in the Canadian domestic market.

30. Canadian database creaters and information vendors wish to have the current and potential importance of the Public Online Information Retrieval Services industry, and its role in an information-based society recognized by the federal government. As a starting point, they made the following suggestions:

a. Removal of federal exise duties and sales taxes on imported computer equipment. Failing this measure, a tax credit system be adopted to refund such taxes, at least for all service bureaus, database vendors and electronic publishers.

b. Active steps be taken to encourage production of databases from information content created by Canadian government agencies and research institutions or with the support of federal funds.

c. That the distribution of Canadian databases for the Canadian and world markets be encouraged and that such activities be given the same type of support that is currently extended towards those manufacturing tangible goods.

31. Canadian service bureaus and database vendors attempting to serve the North American (and worldwide) market wish to be able to configure their private communication networks in the most cost-effective manner possible.

Issues

32. Privacy issues related to the storage and use of information about individuals, outside the jurisdiction where the information was collected, have been recognized for some time and extensively debated in international fora like the Council of Europe, OECD and the IBI.

33. Cultural and sovereignty concerns are increasing as the industry continues its growth.

34. The lack of a clear legal framework for the information industry is considered by many firms to form a major impediment to its development.

35. Almost all of the issues/concerns stated in the context of the introduction of videotex (or Telidon) services are the same as those that have been raised previously in the context of interactive online services in general. Both from an industry and an issues/concerns perspective, videotex (or Telidon) based services should be considered a subset of public online information services and online transaction based services.

## 18. DIRECTIONS FOR FUTURE WORK

1. The development of a detailed mapping of the online or network-based information industry would help in our understanding of industry trends. This would include both private and public online information services, all transaction-based services, intra-firm and closed-user group as well as open market transactions. For purposes of analysis (but not necessarily policy formulation), a distinction should also be made between the use of computer/communication technologies to enhance existing hard-copy information-based activities versus the introduction of new information products and services.

2. There are many gaps in the available quantitative information, both with respect to the U.S. and the Canadian markets for information retrieval services. The greatest need for information is in the following areas:

   a. Demand data (usage volumes and expenditures incurred);

   b. Exports and imports of such services; and,

   c. Competitive position of Canadian vendors in specific sub-markets.

3. The mass or consumer market aspect of computer/communication-based products and services requires further analysis and collection of data for analysis.

4. The Cultural Statistics Program, managed jointly by Statistics Canada and the Department of Communications, could be expanded to include "computer/

communications-based information services" as a distinct survey area. This would include public online retrieval services, electronic publishing, Videotex and all other suppliers who provide digital information products and services.

5. Information services are currently being offered both as free public goods and as priced competitive services. The question of "unfair government competition in the area of information services" has been discussed extensively in the U.S. and Canada. In the U.S., it culminated in the establishment of an independent task force assembled by the National Commission on Libraries and Information Science (NCLIS). This Public/Private Sector Task Force completed a two year study with the publication of a report in March 1982 titled "Public/Private Sector Interaction in Providing Information Services". The findings of that report could form a starting point for discussion of the same issues in Canada.

6. Exploration of the feasibility and cost of various types of demand stimulation measures could be useful. One such measure that could be considered is the possible subsidization of the use by students, in Canadian universities and post-secondary institutions, of information retrieval services provided by Canadian vendors. The analogy here would be that of providing an "information grant" instead of an equipment grant.

7. Another area of possible future work is the development of a process that will assist in identifying and promoting the development of world class or world mandate information databases. In particular, the possible pay-offs to Canada in developing a program to encourage the creation of databases,

useful not only to Canadian business and research but providing a world market niche along the lines of that of the Commission of the European Communities, warrants further exploration.

8. Of the issues arising from this study, the three most important for addition attention in future work are,

- privacy;
- legal framework or basis for information services; and,
- cultural and sovereignty concerns.

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# REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

# VOLUME II

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# REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

## VOLUME II

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APPENDIX A

# OVERVIEW OF SELECTED CANADIAN

# AND U.S. DATA BASE VENDORS

This appendix contains a general overview of selected Canadian database vendor firms, which are listed in the Cuadra Directory. The 18 vendors with headquarters in Canada are listed in Table A.1. For each vendor, the following information is provided:

i) Location of headquarters and computer centre;

ii) Types and numbers of databases offerred;

iii) Access via public and private telecommunications networks.

Table A.1 shows that 7 out of the 18 Canadian vendors provide only textual databases (Reference/Bibliographic or Source Full Text). Of the 11 vendors providing source numeric databases, only 3 provide 5 or more such databases (The Conference Board in Canada, I.P. Sharp Associates and FRI Information Services Ltd.); the other 8 offer 1-3 databases. Sharp offers more source numeric databases than all other Canadian vendors combined.

Notes: Symbols used in Tables A.1.

1. Type of Database

R = Reference, S = Source

B = Bibliographic, R = Referral

N = Numeric, T = Textual, F = Full-Text, P = Properties

2. Telecommunications Networks

LL = Private Leased Lines

DDD = Direct Distance Dial (ordinary long distance)

1 = Datapac (Canadian coverage); interconnected with Telenet, Tymnet

2 = Telenet (U.S., 36 other countries)

3 = Tymnet (U.S., 40 other countries)

4 = Euronet (EEC countries)

5 = Scannet (Scandinavia: Denmark, Finland, Norway, Sweden, Iceland)

6 = Transpac (France)

1-6 are public, packet switched networks

3. Sources

Directory of Online Databases

Cuadra Associates, Vol. 3, No. 1, Fall 1981.

Table A.1

Characteristics of Selected Database Vendors
Firms with Headquarters in Canada

| Vendor Name | Location | | Database Offerred | | Telecom. Networks | | Comments |
|---|---|---|---|---|---|---|---|
| | HQ | Computer | Types | No. | Own. | Public P.S. | |
| Advertising Management Systems | Toronto | - | S(N) | 1 | | 1 | BBM Bureau of Management |
| Alphatext, Inc. | Ottawa | Ottawa | S(F) | 1 | | 1,2 | National Master Specification |
| Boreal Institute for Northern Studies | Edmonton | Edmonton | R(B) | 1 | | 1 | Boreal Lib. Catalogue |
| Canada Centre for Remote Sensing | Ottawa | Ottawa | R(B) | 1 | | DDD only | RESORS |
| CISTI | Ottawa | Ottawa | R(B) | 18 | | 1 | CAN/OLE and CAN/SDI systems |
| Computel Systems Ltd. | Ottawa | Ottawa | S(N) | 1 | LL | 1 | CANSIM Mini-Base |
| The Conference Board in Canada | Ottawa | Toronto | S(N) | 7 | | 1 | |
| Datacrown, Inc. | Toronto | Ottawa, Toronto | S(N) | 2 | LL | 1,2,3 | CANSIM, Citibase |
| Dataline Systems Ltd. | Toronto | Toronto | S(N)<br>S(T) | 1<br>1 | LL | 1,2,3 | CANSIM Mini-Base, RAPID |
| FRI Information Services Ltd. | Montreal | Montreal | S(N) | 10 | | 1,2,3 | |
| Harris Media Systems Ltd. | Toronto | - | S(N) | 2 | | 1 | BBM, PMB |
| I.P. Sharp Associates Ltd. | Toronto | Toronto | S(N)<br>S(T)<br>R(B) | 62<br>2<br>2 | APL Network | 1,2,3 | |
| IBM Canada Ltd. | Toronto | Toronto | S(N) | 1 | LL | 1 | CANSIM Mini-Base |
| Industrielle-Services Techniques Inc. (IST) | Montreal | Montreal | S(N) | 1 | LL | 1 | CANSIM Mini-Base |

Table A.1 (continued)

Characteristics of Selected Database Vendors
Firms with Headquarters in Canada

| Vendor Name | Location | | Database Offerred | | Telecom. Networks | | Comments |
|---|---|---|---|---|---|---|---|
| | HQ | Computer | Types | No. | Own. | Public P.S. | |
| Info Globe | Toronto | Toronto | S(F) | 1 | | 1,2,3 | ° Uses Datacrown Inc. |
| Informatech | Montreal | - | R(B) | 7 | | 1 | French Language |
| McGill University Computing Centre | Montreal | Montreal | S(N) | 1 | | 1,2 | F*A*C*T |
| QL Systems Ltd. | Ottawa | Kingston | R(B)<br>R(R)<br>S(F) | 22<br>2<br>18 | | 1,2 | |

APPENDIX B

# REFERENCE/BIBLIOGRAPHIC AND SOURCE FULL TEXT DATABASES: CANADIAN VENDORS

The Canada Institute for Scientific and Technical Information (CISTI), QL Systems Limited, Informatech and the University of Alberta are the main Canadian vendors of reference databases. QL Systems also provides access to a number of full-text databases. These vendors face competition from the three major U.S. search services: Dialog Information Systems (DIALOG), Systems Development Corporation (SDC), whose services in Canada are marketed by Infomart, and Bibliographic Retrieval Services (BRS). Info Globe is the major Canadian supplier for full-text news databases.

## A. CISTI

The Canada Institute for Scientific and Technical Information (CISTI), a division of the National Research Council (NRC), evolved from the National Science Library. Its mandate is derived from a Cabinet Committee Decision on Scientific and Technical Information Dissemination, dated December 11, 1969. The mandate requires CISTI to provide Canadian researchers, technologists and managers in industry, government and universities with scientific and technical information "at the right time, at the right place and in the right form". The CAN/OLE and CAN/SDI Systems are CISTI's main computer-based tools. It also serves as an access node to MEDLARS, the U.S. National Library of Medicine's online information system.

### 1. CAN/OLE

CAN/OLE (Canadian Online Enquiry System) is a national online information retrieval system for the retrospective searching of bibliographical reference files in all major fields of science and technology. The service has

been in operation since March 1974 and is actively used by R&D organizations in industry, government and universities. The system can be accessed from over 50 Canadian cities, through the TCTS Datapac communications network, without incurring long-distance charges. A list of bibliographic/reference databases accessible through CAN/OLE, as of March 1981, is given in Table B.1; 18 databases containing over 10.7 million citations were covered. There were 680 terminal users in 353 CAN/OLE centres as of that date; 12,277 CAN/DOC online document ordering requests were processed during the 6 month period September 1980 - February 1981.

CAN/OLE pricing is based upon three charge elements: access, storage and offline printing. All databases are available at a base rate of $40.00 per connect hour, plus a royalty which varies from zero to $30.00 per connect hour; the non-Canadian databases tend to have the higher royalties. The base rate includes the cost of communications from all cities served by the TCTS Datapac network; costs incurred in reaching a Datapac node are the responsibility of the user. The storage charge is $0.20 per month per page of 4096 characters; this is equivalent to about $49.0 per month per million characters. Offline prints are charged at a rate of 3.5 cents per citation, plus royalties where applicable.

CAN/OLE usage statistics are given in Table B.3, for the years 1977/78 to 1980/81. These show that over the last 3 years the number of databases available has increased from 8 to 18 (125%); the number of citations contained in these databases from 5.5m to 10.7m (94.55%); the number of CAN/OLE access centres from 136 to 353 (259.6%); the number of database connects/searches from 22,525 to 108,799 (383%) and the number of annual connect hours from 3,619 to

6,324 (74.74%). The greatest increase has been in online document orders, which grew from 1508 in 1977/78 to 23,330 in 1980/81; this is a 15.5 fold increase in just 3 years, or an annual increase of 150% each year.

## 2. CAN/SDI

CAN/SDI (Canadian Service for the Selective Dissemination of Information) is a current awareness service which keeps researchers informed, on a continuing basis, of recent publications in their field. This is done by searching, in a batch mode, the researcher's customized "information profile" against one or more specified databases, and forwarding the references retrieved (normally a printout) to the customer by mail or a courier service. The search frequency varies from once a week to once a month, depending on the database. A list of the available databases and the subject areas they cover is given in Table B.2. Currently there are more than 3,200 interest profiles on CAN/SDI, being searched against one of 19 databases. Each profile represents the information needs of an average of two researchers. CAN/SDI users exist in all provinces of Canada, the USA and some other countries.

The five major CAN/SDI centres, and their respective areas of expertise and support, are as follows:

| | | |
|---|---|---|
| (i) | Science and Technology | - CISTI, NRC |
| (ii) | Humanities and Social Sciences | - National Library of Canada |
| (iii) | Agricultural Sciences | - Agriculture Canada |
| (iv) | Geosciences | - Geological Survey of Canada<br>Department of Energy, Mines and Resources (EMR) |

(v) Metallurgy - CANMET (Canada Centre for Mineral and Energy Technology), EMR

CAN/SDI activity statistics for the years 1977/78 to 1980/81 are given in Table B.3. Compared to the vigorous growth in CAN/OLE usage, that of CAN/SDI has remained stable or even declined. Thus the number of databases has increased from 18 to 19, the number of subscribers has grown by 3.66% from 2102 to 2179, and the number of interest profiles has stabilized around 3200. The number of searches conducted has declined by 9.34% from 102,800 to 93,200, and the number of citations printed by 3.9% from 5.64 million to 5.42 million. The difference in CAN/OLE and CAN/SDI usage patterns can probably be ascribed to a shift in user preference, from retrospective batch searching at a scheduled frequency, requiring a turnaround time of days, to online searching on an as-and-when required basis.

## 3. Revenues and Costs

CISTI's revenues and costs for 1980/81 were $1.252m and $12.191m respectively; thus revenues covered 10.27% of total costs. In 1979/80 the corresponding figures were $1.103m, $10.597m and 10.41% respectively. External revenues, i.e. revenues from non-NRC users, accounted for $1.069m (80%) of the total in 1980/81 and $.947m (86%) of the total in 1979/80.

Until precise revenues and costs can be attributed to the CAN/OLE and CAN/SDI activities, it is not possible to determine the extent to which these activities might be subsidized. The beneficiaries of this subsidy are, of course, the end users, who include a large number of libraries. If CAN/OLE and

CAN/SDI services are being offered at substantially lower prices than those required for full cost recovery, this might make it impossible for private Canadian vendors to enter this area of the market. On the other hand, an increase in rates for CAN/OLE and CAN/SDI services might force public libraries (municipal and post-secondary educational institutions) to reduce or restrict their use of the service, due to financial constraints.

## B. QL Systems Limited

### 1. Service Description and Costs

QL Systems Limited was incorporated in 1973 to carry forward the work commenced by the QUIC/LAW project at Queen's University in 1968. Since its incorporation the firm has been dedicated to developing and maintaining QL/SEARCH, the first Canadian commercial information retrieval system for textual databases.

The QL/Search Information Retrieval Service is used across Canada, and in the U.S., Europe, Australia and New Zealand by research workers, government agencies and various types of libraries (academic, legal, business and public). QL Systems Limited had sales of over $1m in 1980, and employed 40 people. The firm has its headquarters in Ottawa, with branches in Toronto and Kingston. Its computer centre is located in Kingston, Ontario. QL Systems does not have a marketing or support organization outside central Canada, or franchised agents to sell its services outside Canada.

QL/SEARCH provides online retrieval to over 40 databases. These databases, listed in Table B.4, are concerned with Parliament and the government, the law, business, communications, energy, mining, environment and pollution, the Canadian North, and related subjects. Some QL databases, especially those dealing with the law and Parliament, are full text; others are reference databases containing abstracts or only the titles. The retrieval system searches each database selected. Any document containing the user's search word or words is retrieved and can be printed out at the user's terminal, or offline on a high speed printer. The system handles natural language queries, provides Boolean logic and includes phrase searching capabilities.

Access is via the TCTS Datapac packet-switched communications network in Canada, and the Telenet or Tymnet networks in the U.S. Communications charges are $7.50 per connect hour for Datapac, and $10.00 per connect hour for Telenet and Tymnet. System use costs include $2.00 to select a database and $2.00 for each search strategy; there are no fixed costs. The basic pricing philosophy has been to break out the access and search cost components, rather than bundle them into a single connect time charge, which seems to be the normal practice for search services and vendors of full text databases.

Under market pressure, however, the company has begun to experiment with another pricing scheme. Under this scheme, QL Systems provides the user with a terminal and allows him to search any of its databases for $90 per connect hour; a minimum monthly committment of 4 hours ($360) is required. Depending upon the cost of the terminal, this would be equivalent to a rate of $60-70 per connect hour, including telecommunications costs.

2. Products and Markets

a) QL System's first major product is its three software packages, which it offers for lease or purchase. These are:

i) Q/L Search - The library of textual database management and retrieval programs that have been developed to operate QL's Information Retrieval Service;

ii) Q/L NEWS - This software provides facilities for storing the full text of a newspaper, for offering a newspaper's librarians the capability of enhancing the text, and for retrieving the full text of any story;

iii) Q/L Text - QL's text editing system, which can be used as a word processing system and has an Electronic Mail capability.

The basic search software was considered state-of-the-art when first developed. It was purchased by the West Publishing Company in the U.S. to form the basis of the Westlaw service, and by Info Globe to run its news database. Both companies have, of course, heavily modified the original software. QL Systems currently sells copies of the software package for $65K. This price includes installation costs ($5K) and 1 year's free maintenance. The firm is now changing from outright sales to lease of maintained versions of the software, and requiring that user enhancements be shared with QL Systems. QL's software systems have been installed at several locations, in Canada and the U.S.

b) Legal Databases form the first, and still the most important portfolio area for the firm; 14 are currently offerred (Table B.4). This is primarily due to its history, and the early support received from the Department of Justice. QL Systems is the only commercial Canadian vendor in this area. Canadian legal firms have, however, been far slower to use legal databases than their U.S. counterparts, who have made both LEXIS and Westlaw a success. As a consequence, growth in this area has been slower than anticipated. QL currently has some 25 Canadian legal firms as clients, but the number is increasing. QL still predicts that legal databases will be a major growth area in the 1980s; the potential users include the courts, as well as every legal firm of any size in the country.

c) Databases related to the Environment form the second major portfolio area of QL, with 9 currently being offered. The Departments of the Environment and Fisheries and Oceans were early supporters of QL. They have paid for the computer and storage costs of the WATDOC group of databases, which are currently running at about $100K per year. Usage of these environment databases is still very small, however, and does not allow QL to recover their full computer and storage costs. If the support costs paid by these departments are cut off, QL may have to drop these databases. The only other potential Canadian vendor is CISTI. If neither Canadian vendor could support these databases, Canadian users would have to go to a U.S. vendor to access databases created in Canada by public agencies using public funds.

d) As a third portfolio, QL Systems is trying to build up Energy and Mining databases. This is a new area of considerable interest and importance in Canada. The firm has received support from the Canada Centre for Mineral and Energy Technology (CAN/MET), and currently offers 5 databases in this area.

e) QL Systems has started to offer a news database and retrieval service called Newstex. The information producer is Canadian Press, an agency owned jointly by over 100 Canadian newspapers. The service is sponsored by Canadian Press and may compete with Info Globe's service in the future. The database currently contains material going back to May 1981 and it is updated daily.

## C. Info Globe

### 1. Service Description and Costs

Info Globe, a division of The Globe and Mail, operates the first Canadian news database. This full-text, online information databank, based on a heavily modified version of the QL Systems retrieval software, has been operational since November 14, 1977. The database, consisting of more than 250,000 articles from the Globe and Mail, including the Report on Business, is updated daily. Each update consists of over 1 million characters of information. The database has grown to almost 1.5 billion characters. The updated database is available at 8:00 a.m. each morning, concurrently with the issue of the printed Globe and Mail. Articles can be retrieved by searching on any word or phrase, as the software supports full free-text searching. In addition to regular Globe and

Mail sources, information providers include the New York Times Wire Service, Canadian Press, Associated Press, Reuters and UPI.

Info Globe has contracted out the data processing function to Canada Systems Group, the largest computer service bureau in Canada. Database hours of service are 0800 to 2400 Eastern Standard Time on weekdays, and 0800 to 1800 on weekends. The database computer in Toronto can be accessed via the public switched telephone network, or via packet switched networks like Datapac in Canada, GTE Telenet and Tymnet in the U.S. and their international equivalents. Any ASCII compatible terminal, including personal computers and word processors, can be used. Access is provided at both 300 and 1200 baud. There are no subscription charges. Costs are based on usage alone, which is currently charged at $2 per minute of connect time ($120/hr.). There are currently over 300 users of the service, and usage is growing rapidly. No usage volume or revenue data have been reported or released to date.

## 2. Products and Markets

Info Globe's product is an information research tool. Its market consists of three basic segments. These are described below, in order of importance:

a) The primary and major market is the private sector, consisting of major Canadian corporations, financial institutions, investment houses and professional consultants;

b) Government agencies and some specialized libraries constitute a secondary market; these organizations find Info Globe services cost effective versus the conventional clipping and indexing services;

c) A tertiary and smaller market is made up of the educational sector, including universities and public libraries.

The mass consumer market for such news databases is currently insignificant, but it may become important in the future, for the reasons discussed in Sections 8.4 and 8.5 of the main report.

Info Globe has a unique product, based on a unique source, the Globe and Mail, which is competitive both nationally and internationally. The only other similar service currently available in Canada is the New York Times Information Service (NYTIS). This provides access to an Information bank which holds nearly 2 million abstracts and bibliographic references from 60 general interest and specialized publications, such as the New York Times, Wall Street Journal, Washington Post, Business Week and Financial Times (London). NYTIS has been much slower than Info Globe, however, in providing a full-text database and allowing full free-text searching. In any case, Info Globe considers the two services to be complementary, rather than competitive, because of their very different information content.

Info Globe has just announced a new product called Marketscan. Designed as an online stock market service for both traders and individuals, Marketscan delivers daily quotations of stock exchange transactions, with volume, highs, lows and closing prices of any stock listed on the Montreal,

Toronto, Alberta, New York and American Stock Exchanges. Figures for a particular stock can be obtained for the last 100 days of trading, or for the date range selected. Alternatively, the performance of a number of selected stocks can be compared for a particular trading day. The authenticity of all the information provided is verified by Dataline Inc., a computer service bureau in Toronto which specializes in online services. Usage costs are $1.00/minute of connect time from 0800 to 2000, and $0.50/minute from 2000 to 2400 (midnight); there is a monthly minimum charge of $10.

Table B.1: Databases on CAN/OLE

| Database Code | Database Name | Information Provider/Producer | Coverage | Number of records as of March 81 | Number of records per update | Updates per year |
|---|---|---|---|---|---|---|
| Non-Canadian Databases | | | | | | |
| BA | BIOSIS Previews | BioSciences Information Service (US) | 1972-78 | 1,712,240 | - | - |
| BA79 | BIOSIS Previews | BioSciences Information Service (US) | 1979- | 689,919 | 22,000 | 12 |
| CAC | CA Condensates | American Chemical Society (US) | 1973-78 | 2,214,740 | - | - |
| CAS | CA Search | American Chemical Society (US) | 1979- | 936,821 | 36,000 | 12 |
| CHEMX | Chemical Index | American Chemical Society (US) | 1979- | 1,083,000 | - | 12 |
| COAL | Coal Research | IEA Coal Research Technical Information Service | 1979- | 20,000 | - | 12 |
| EI | Compendex | Engineering Index Inc. (US) | 1970- | 960,000 | 8,100 | 12 |
| INSP | INSPEC: Physics, Electrical and Electronic, and Computer and Control Abstracts | Institution of Electrical Engineers (UK) | 1970- | 1,547,343 | 14,500 | 12 |
| NTIS | Government Reports Announcements and Index | National Technical Information Service (US) | 1971- | 588,000 | 3,000 | 12 |
| Canadian Databases | | | | | | |
| AOSI | Alberta Oil Sands Index | Alberta Research Council | 1970- | 6,246 | 200 | 4 |
| CODOC | Cooperative Document Project | CODOC Document Group (Guelph) | Pre-Confederation | 723,000 | 6,000 | 6 |
| ELIAS | Environment Libraries Automated System | Environment Canada | 1976- | 23,808 | 300 | 12 |
| IEC | Directory of Federally Supported Research in Universities | National Research Council Canada | 1971/72- | 86,740 | 9,800 | 1 |

Table B.1: Databases on CAN/OLE (continued)

| Database Code | Database Name | Information Provider/Producer | Coverage | Number of records as of March 81 | Number of records per update | Updates per year |
|---|---|---|---|---|---|---|
| Non-Canadian Databases | | | | | | |
| NRIS | Northern Research and Documentation Service | Department of Indian and Northern Affairs | 1976- | 852 | 200 | 1 |
| OON | CISTI Catalogue | National Research Council Canada | 1978- | 110,000 | 1,200 | 12 |
| OONL | CAN/MARC (CANadian MAchine-Readable Cataloguing) | National Library of Canada | 1973- | 148,000 | 2,300 | 12 |
| OOT | Canadian Transportation Documentation System | Transport Canada | 1960- | 86,307 | 11,800 | 4 |
| UNION | Union List of Scientific Serials in Canadian Libraries | National Research Council Canada | | 50,000 | 600 | 4 |

Table B.2: Reference Databases Available Through CAN/SDI

| Database | Subject/ Field | Information Provider/Producer | Abstract Available | Updates per year | CAN/SDI Centre |
|---|---|---|---|---|---|
| AGRICOLA | Agriculture | U.S. Dept. of Agriculture | No | 12 | Agriculture Canada |
| ASFA | Aquatic Sciences, Fisheries | Information Retrieval Ltd., GB, under contract to FAO, UN | Yes | 12 | CISTI |
| BIOSIS PREVIEWS | Biology | Biosciences Information Services, Penn., USA | No | 36 | CISTI |
| CANCERLIT | Cancer | National Library of Medicine, Md., USA | Yes | 12 | CISTI |
| CA SEARCH | Chemistry | Chemical Abstracts Service, Ohio, USA | No | 52 | CISTI |
| CHEMICAL TITLES | Chemistry | Chemical Abstracts Service, Ohio, USA | No | 26 | CISTI |
| COMPENDEX | Engineering | Engineering Index Inc., NY, USA | Yes | 12 | CISTI |
| ERIC | Education, Multidisciplinary | ERIC Processing and Reference Facility, Md., USA | Yes | 12 | National Library of Canada |
| FSTA | Food Sciences | International Food Information Service (IFIS), Frankfurt, W. Germany | Yes | 12 | Agriculture Canada |
| GEOREF | Geology | American Geological Institute, Va., USA | No | 12 | Geological Survey of Canada |
| INSPEC | Computers & Control, Electrical & Electronics, Physics | INSPEC Retrieval Services Dept., Institutions of Electrical Engineers, London, GB | Yes | 24 | CISTI |

Table B.2: Reference Databases Available Through CAN/SDI (continued)

| Database | Subject/ Field | Information Provider/Producer | Abstract Available | Updates per year | CAN/SDI Centre |
|---|---|---|---|---|---|
| MARC II | Multidisciplinary | MARC Distribution Service, Library of Congress, USA | No | 52 | National Library of Canada |
| MEDLINE | Medicine | National Library of Medicine, Md., USA | Partial | 12 | CISTI |
| METADEX | Metallurgy and Metals | American Society for Metals, Ohio, USA | Yes | 12 | CANMET |
| NTIS | Humanities, Multidisciplinary, Science & Technology | National Technical Information Service, U.S. Dept. of Commerce | Yes | 26 | CISTI |
| SCI | Multidisciplinary, Science & Technology | Institute of Scientific Information, Philadelphia, Penn., USA | No | 52 | CISTI |
| SSCI | Humanities, Multidisciplinary, Social Sciences | Institute for Scientific Information, Philadelphia, Penn., USA | No | 52 | National Library of Canada |
| TOXLINE | Toxicology | Toxicology Information Program, National Library of Medicine, Md., USA | Yes | 12 | CISTI |

Table B.3: CISTI Staff Size, Budget, and Volume of Activity
(Revenues and Expenditures in $000's)

| Item | 1977/78 | | 1978/79 | | 1979/80 | | 1980/81 | |
|---|---|---|---|---|---|---|---|---|
| | Quantity | Y/Y % change | Quantity | Y/Y % change | Quantity | Y/Y % change | Quantity | Y/Y % change |
| A. Person Years | 190 | - | 190 | 0 | 188 | -1.0 | 193 | 2.70 |
| B. Expenditures | | | | | | | | |
| Salaries | 3,268 | - | 3,542 | 8.38 | 3,361 | -5.11 | 4,128 | 22.82 |
| Acquisitions | 2,308 | - | 3,454 | 49.70 | 3,914 | 13.32 | 4,607 | 17.71 |
| Other | 2,954 | - | 2,751 | -6.87 | 3,322 | 20.76 | 3,456 | 4.38 |
| TOTAL | 8,530 | - | 9,747 | 14.27 | 10,597 | 8.72 | 12,191 | 15.04 |
| Salaries/Total (%) | 38.3 | - | 36.3 | | 31.7 | | 33.9 | |
| Acquisitions/Total (%) | 27.0 | - | 35.4 | | 36.9 | | 37.8 | |
| C. Revenues | | | | | | | | |
| From NRC | N/A | | N/A | | 156 | - | 183 | 17.31 |
| Non-NRC | 822 | - | 858 | 4.38 | 947 | 10.37 | 1,069 | 12.88 |
| TOTAL | 822 | - | 858 | 4.38 | 1,103 | 28.55 | 1,252 | 13.51 |
| D. Revenues/Exp. (%) | 9.64 | | 8.0 | | 10.41 | | 10.27 | |
| E. CAN/OLE Activity | | | | | | | | |
| No. of Databases | 8 | - | 13 | - | 17 | - | 18 | - |
| Records (millions) | 5.5 | - | 7.0 | 27.27 | 8.9 | 27.14 | 10.8 | 20.22 |
| Centres | 136 | - | 198 | 45.59 | 275 | 38.89 | 353 | 28.36 |
| Database Connects/ Searches | 22,525 | - | 31,302 | 38.97 | 56,802 | 81.46 | 108,799 | 91.54 |
| Connect Hours | 3,619 | - | 3,873 | 7.02 | 4,587 | 18.44 | 6,324 | 37.87 |
| Online Document Orders | 1,508 | - | 4,119 | 173.1 | 7,922 | 94.03 | 23,330 | 194.5 |
| F. CAN/SDI Activity | | | | | | | | |
| Subscribers | 2,102 | - | 2,124 | 1.05 | 2,130 | 0.28 | 2,179 | 2.30 |
| Interest Profiles | 3,209 | - | 3,232 | 0.72 | 3,214 | -0.56 | 3,210 | -0.02 |
| Searches (thousands) | 102.8 | - | 97.8 | -4.87 | 94.1 | -3.78 | 93.2 | -0.96 |
| No. of Databases | 18 | - | 18 | - | 19 | - | 19 | - |
| Citations Printed (millions) | 5.64 | - | 5.35 | -5.14 | 5.66 | 5.79 | 5.42 | -4.24 |
| G. Cdn. MEDLARS Use | | | | | | | | |
| MEDLARS Databases | 13 | | 13 | | 16 | | 17 | |
| MEDLARS Records (m) | 4.60 | - | 4.90 | 6.52 | 5.56 | 13.47 | 6.09 | 9.53 |
| MEDLARS Centres | 55 | - | 67 | 21.82 | 86 | 28.36 | 110 | 27.91 |
| Subscribers | - | | - | | - | | - | |
| Connect Hours | 2,747 | | 3,058 | 11.32 | 3,689 | 20.63 | 4,924 | 33.48 |
| Pages Printed (000s) | - | | - | | - | | 233 | |

Table B.4: Databases distributed by Q L Systems Limited

| Subject/ Short Name | Database | Information Producer/Source | Type of Database | Time Span | Update Frequency | Surcharge |
|---|---|---|---|---|---|---|
| A. LAW | | | | | | |
| ACWS | All-Canada Weekly Summaries | Canada Law Book Ltd., Ontario | Reference (Summaries) | 7.1.77- | Weekly | $3/search |
| APR | Atlantic Provinces Reports | Maritime Law Book Co. Ltd. | Full Text | 1969- | | - |
| CCC | Canadian Criminal Cases | Canada Law Book Ltd., Ontario | Full Text (Headnotes) | Jan. 71 - | Twice Monthly | $3/search |
| DLR | Dominion Law Reports | Canada Law Book Ltd., Ontario | Full Text (Headnotes) | Sept. 55 (Vol. 1-89) | Twice Monthly | $3/search |
| FCR (1) (RCF) | Federal Court of Canada Reports | Sponsored by Dept. of Justice | Full Text (Headnotes) | 1971- | Irregu-larly | - |
| RSC (1) (SRC) | Revised Statutes of Canada | Sponsored by Dept. of Justice | Full Text | - | Irregu-larly | - |
| SAC | Statutes of Alberta Citator | Sponsored by Canadian Law Information Council | Full Text | 1970- | Irregu-larly | - |
| SBC | Statutes of British Columbia | B.C. Attorney General's Dept. | Full Text | Up to 31.12.79 | Irregu-larly | - |
| SCR (1) (RCS) | Supreme Court of Canada Reports (Headnotes) | Sponsored by Dept. of Justice | Full Text (Headnotes) | 1930- | Irregu-larly | - |
| SMC | Statutes of Manitoba Citator | Sponsored by Canadian Law Information Council; Law Society of Manitoba | Reference (Citations, Summaries) | 1970- | Irregu-larly | - |
| SNB | Statutes of New Brunswick | Sponsored by NB Attorney General's Department | Full Text | | Irregu-larly | - |
| SO | Statutes of Ontario | (In preparation) | Full Text | | | - |
| SOR (1) | Statutory Orders and Regulations | (In preparation) | Full Text | | | - |

Table B.4: Databases distributed by Q L Systems Limited (Continued)

| Subject/ Short Name | Database | Information Producer/Source | Type of Database | Time Span | Update Frequency | Surcharge |
|---|---|---|---|---|---|---|
| TAR | Tax Advance Rulings | Dept. of National Revenue and Taxation | Full Text | 26.4.74 - | As published | - |
| WCB | Weekly Criminal Bulletin | Canada Law Book Ltd., Ontario | Reference (Summaries) | 27.10.76 - | Weekly | $3/search |
| WWR | Western Weekly Reports | Carswell Co. Ltd., Ontario | Full Text (Headnotes) | 1968- | Irregularly | - |
| B. PARLIAMENT | | | | | | |
| HOQ (1) (HQO) | Hansard Oral Questions | Sponsored by House of Commons, Ottawa | Full Text | 29.1.73 - | Biweekly | - |
| HWQ (1) (HQE) | Hansard Written Questions | Sponsored by House of Commons, Ottawa | Full Text | 4.1.73 - | Biweekly | - |
| SPK (1) (REG) | Speakers' Rulings of the House of Commons | House of Commons, Ottawa | Full Text | 15.10.74 29.6.76 | Irregularly | - |
| STO (1) (DLO) | Standing Orders of the House of Commons | House of Commons, Ottawa | Full Text | Jan. 76 - | Irregularly | - |
| C. ENVIRONMENT | | | | | | |
| ASFA | Aquatic Sciences and Fisheries Abstracts | Sponsored by ° WATDOC, Fisheries and Environment Canada ° FAO and other UN agencies | Reference (Abstracts) | Jan. 78 - | Monthly | - |
| BNT | Boreal Northern Titles | Boreal Institute for Northern Studies, Univ. of Alberta | Reference (Citations) | Jan. 72 - | Monthly | - |
| CENV | Canadian Environment | Sponsored by WATDOC, Environment Canada | Reference (Abstracts) | 1970- | Monthly | - |
| DEL (4) | Delft Hydro | Sponsored by WATDOC, and Delft Hydraulics Laboratories, Netherlands | Reference (Abstracts) | 1976- | Irregularly | - |

Table B.4: Databases distributed by Q L Systems Limited (Continued)

| Subject/ Short Name | Database | Information Producer/Source | Type of Database | Time Span | Update Frequency | Surcharge |
|---|---|---|---|---|---|---|
| DREF | Data Reference (inventories of data collects and data handling systems) | Sponsored by WATDOC | Reference (Abstracts) | Early 1980s to present | Semi-Annually | - |
| ENV (2) | Environment (French counterpart of CENV) | Sponsored by WATDOC | Reference (Abstracts) | 1970- | Monthly | - |
| SOL | Solid Waste | Produced by Environment Protection Service and WATDOC | Reference (Abstracts) | 1970- | Irregularly | - |
| SWR (3) | Selected Water Resources Abstracts | Sponsored by WATDOC, produced by U.S. Dept. of the Interior | Reference (Abstracts) | Feb. 75 - | Monthly | - |
| YKB | Yukon Bibliographies | Boreal Institute for Northern Studies, Univ. of Alberta | Reference (Citations & Abstracts) | 1971- | Irregularly | - |
| D. BUSINESS, GOVERNMENT GENERAL | | | | | | |
| AST | Artic Science and Technology Information System | Artic Institute of North America, Univ. of Calgary | Reference (Citations & Abstracts) | 1978- | | - |
| CBI | Canadian Business Index | Micromedia Ltd. | Reference (Citations) | July 75 - | Monthly | $14/ online hour, plus $0.15 per document printed |
| CNI | Canadian News Index | Micromedia Ltd. | Reference (Citations) | Jan. 77 - | | |
| COMM | Communications Information | Prof. J. Black, Univ. of Guelph | Reference (Citations) | 1960- | 6 times per year | - |
| CPL | Canadian Plains Research Inventory | | | | | |

Table B.4: Databases distributed by Q L Systems Limited (Continued)

| Subject/ Short Name | Database | Information Producer/Source | Type of Database | Time Span | Update Frequency | Surcharge |
|---|---|---|---|---|---|---|
| ECON | Economics (index of items published in 1979 International Bibliography of Economics) | Published by International Committee for Social Science Information and Documentation | Reference (Index) | 1979 | Irregularly | - |
| ENC | Energy Calendar of Events (Conferences, Seminars, etc.) | Energy, Mines and Resources Canada (EMR) | Calendar | Present-Near Future | Irregularly | - |
| ENG | Energy Projects (ongoing projects in Canada) | EMR and Provincial Energy Departments/ Agencies | Reference (Abstracts) | Present | As required | - |
| ENP | Energy Programs (description of federal and provincial programs) | EMR and Provincial Departments/Agencies | Full Text (Descriptions) | Present | As required | - |
| FEES | Fees Charged for Library Services | Students of the Graduate School for Library Science, McGill University | Reference (Abstracts) | 1974- | Irregularly | - |
| IBSS | International Bibliography of the Social Sciences | | | | | |
| MET | Metals Abstract (METADEX) - metals, metallurgy and related subjects | American Society for Metals, Ohio, USA | Reference (Citations) | 1974- | Irregularly | $25/hr. + $0.04/ document |
| MNT | | CANMET, EMR Canada | Reference (Abstracts) | May 73- | Irregularly | - |
| OGI | Ontario Government Information | Citizens Inquiry Bureau, Min. of Culture & Recreation, Govt. of Ontario | KWIC Index, Documents | 1978- | Irregularly | |
| WAA | World Alimunium Abstracts | American Society for Metals, Ohio, USA | Reference (Abstracts) | 1968- | Monthly | ? |

Notes:
1. Also available in French language version, name in brackets.
2. Available in French language only.
3. Available in Canada only.
4. Available outside Europe only.

APPENDIX C

SOURCE ALPHA-NUMERIC DATABASES:

STATISTICS CANADA (CANSIM)

Statistics Canada is the country's largest producer and disseminator of statistical information. The agency provides information, free or at nominal cost, on almost every type of economic and social activity in Canada. Statistics Canada regional offices now receive in excess of 160,000 requests for information per year. In addition to some 1,300 publications issued every year, the agency also disseminates its information through such media as microfiche, microfilm, computer printouts, computer tapes and CANSIM. It has also started to use Telidon as a medium of dissemination.

## A. CANSIM

CANSIM (Canadian Socio-Economic Information Management System), Statistics Canada's machine-readable database, is the agency's principal tool for disseminating information in machine-readable form. CANSIM comprises two modules. These are the Time Series Module, containing current and historical information from a broad range of interrelated socio-economic fields, and the cross-classified module, which addresses the demand for multi-dimensional tabular data. The data for these two modules, together with the CANSIM software for data entry, information retrieval and administrative support, are housed at the host service bureau. This was previously Datacrown Ltd., but became IST Inc. on April 1, 1982. Both modules can be accessed in interactive or remote-batch mode, via the telecommunications network linking the host service bureau to all points in North America. CANSIM time series data can also be accessed at 12 Secondary Distributors, and a number of organizations (like universities) which obtain the data for private use.

Time Series Module

The CANSIM Time Series module contains major groups of data on the following subject matter areas:

- System of National Accounts
- Prices and Price Indexes
- Labour
- Manufacturing and Primary Industries
- Capital and Finance
- Construction
- Merchandising and Services
- External Trade
- Transportation
- Agriculture and Food
- Population Extimates and Projections
- Health and Welfare

It also contains data from the Canadian Statistical Review, the Bank of Canada Review, the Quebec Statistical Review and selected U.S. statistics.

Main Base, Mini Base and Supplement

The CANSIM Main Base currently contains some 300,000 time series and is updated on a daily basis. The CANSIM Mini Base is a standard subset of data drawn from the Main Base, containing approximately 18,000 of the most widely

used series, which are updated daily. The Mini Base is currently offered by ten Canadian Secondary Distributors and two U.S. ones (Table C.1). A Secondary Distributor is an organization (usually, but not always, a computer service bureau) that has agreed to disseminate CANSIM data according to Statistics Canada guidelines. The Secondary Distributors provide the end users with a large choice of suppliers, software, telecommunications networks and technical support staff in accessing CANSIM data. With the exception of Canada Systems Group Ltd., all the other major central Canadian service bureaus have become CANSIM secondary distributors.

Besides the CANSIM Mini Base, Secondary Distributors can offer their users supplementary series as part of their CANSIM Mini Base supplement. This data set varies from one Secondary Distributor to another, and enables each to meet the unique data needs of their clients. This service is optional, however, and is not utilized by all the Secondary Distributors.

A number of other organizations, notably universities, acquire CANSIM time series data for internal use (e.g. by faculty members and students, for teaching and research). These organizations do not usually resell the data for use by third parties.

Cross-Classified Module

This module is of particular interest to analysts and researchers specializing in social studies and societal evolution/problems. It meets the need for combining cross-tabulation and analysis of data on social conditions

(i.e. demographics, family structure, occupation, income, etc.) available from the Census, with data on social phenomena in the fields of education, health, welfare, justice and others.

For uniformity, statistical data are organized in this system according to a standard format - the Table. The structure of the cross-classified table allows data of up to nine levels of cross-classification to be entered, stored and retrieved. Descriptive information provides titles, footnotes, explanations and definitions to foster the proper use of the table.

Tables have been identified for 1976 Census data, agriculture, family income and expenditure. Information on health, justice, education, science and culture has also been identified. The system is being expanded progressively.

The Cross-classified Module has undergone extensive internal testing and use by CANSIM staff and other selected groups. Release for widespread commercial use took place in 1983.

Usage, Revenues and Costs

The CANSIM Main Base software automatically logs all accesses for series retrieval, thus providing usage statistics. Secondary distributors are also required to maintain comparable statistics, and report them every month. On the basis of these statistics, it is estimated that there were approximately 4,000,000 retrievals of series from the Main and Mini Bases in 1980. An annual growth rate of 10-15% is estimated. The fact that work is currently well under

way to provide certain CANSIM data to the user in pre-packaged formats using Telidon (e.g. the Telichart offering) could considerably increase the volume of usage.

Each Secondary Distributor is required to pay $20K per year as a fixed cost. CANSIM does not levy royalty charges for the use of its data. The Secondary Distributors, because of competitive market pressures, have not done so either up to now. In addition to the fixed costs, the Secondary Distributors incur considerable computer costs, due to daily updating, and data storage costs. Their perceived benefits from offering the Minibase (and Supplement) must at least equal these out-of-pocket and opportunity costs.

CANSIM receives revenues of about $200K per year from the Secondary Distributors. This covers less than 25% of its computer usage and data storage costs, which are currently running at about $950K per year. If personnel and overhead costs are included, it will be seen that CANSIM, as a database producer, is providing a considerable subsidy for the widespread dissemination of its data in machine-readable form. Whether the cost to the end users should be increased by levying some form of royalty, which can then be used to reduce CANSIM's operating deficit, is a question that will have to be faced if CANSIM is required to operate in a full cost recovery node.

Table C.1: Primary and Secondary Distributors of CANSIM Databases

| Service Bureau | Datacentre Location | Type of Distributor | Type of Base | No. of Time Series | Approx. No. of Users | Comments |
|---|---|---|---|---|---|---|
| Industrial Life-Technical Services (IST) Inc. | Montreal | Primary (Host) | °Main Base °Cross-classified | 300,000+ | | |
| Computel Systems Ltd. | Ottawa | Secondary | Mini Base + Supplement | 30,000+ | | |
| Computer Sciences Canada Ltd. | Metro Toronto | Secondary | Mini Base | 18,000+ | | |
| Comshare Ltd. | Metro Toronto | Secondary | Mini Base | 18,000+ | | |
| Conference Board in Canada | Metro Toronto | Secondary | Mini Base + Supplement | 25,000+ | | |
| Data Resources Incorporated | Lexington, Mass. USA | Secondary | Mini Base | 18,000+ | | |
| Dataline Systems Ltd. | Metro Toronto | Secondary | Mini Base + Supplement | 30,000+ | | |
| FRI Information Services Ltd. | Montreal | Secondary | Mini Base | 18,000+ | | |
| IBM Service Bureaus | Metro Toronto | Secondary | Mini Base | 18,000+ | | |
| Datacrown Ltd. | Metro Toronto | Secondary | Mini Base | 18,000+ | | |
| Interactive Data Corp. (IDC) | Waltham, Mass. USA | Secondary | Mini Base | 18,000+ | | |
| I.P. Sharp Associates | Metro Toronto | Secondary | Mini Base + Supplement | 60,000+ | | |

Note: Primary and secondary CANSIM databases are updated daily.

B. Telidon Activities

An organizational study of Statistics Canada by Price Waterhouse Associates recommended, in February 1980, that the agency should "take the initiative in providing information for distribution through new communications media such as Telidon". The study report noted "Major users in the economic forecasting field rely heavily on the CANSIM database in building models and developing forecasts. The Telidon system.... could be an ideal medium for disseminating statistics to households and medium size businesses who only use such information occasionally".

A Telidon task force was set up to create an initial offering consisting of the following nine information packages: Quiz, Leading Economic Indicators, Consumer Price Index, Today's Economy, Map of Census Data, Fast Facts on Canadians, Energy in the Home, Statistics Canada at Your Service, and June 3 is Census Day. These packages contain about 250 pages of statistics, graphics and textual information. Priority was given to the creation of about 150 "static" pages; these were made available to the DOC demonstration database, the Bell Vista database and other major field trial operators. The next priority was to create about 100 "dynamic" pages, which was updated regularly to reflect changing variables such as leading economic indicators, once software was developed that would allow remote updating, from existing databases like CANSIM, at the required frequency.

This work has resulted in the Telichart Service, which is operated by Faxtel Information Systems Ltd. of Toronto, on contract for Statistics Canada.

Telichart is a graphic display system which retrieves CANSIM time series and presents the information in colour graphics on a Telidon terminal or a personal computer with Telidon software. The Telichart database is a subset of the CANSIM Minibase. Faxtel charges $50 per hour of connect time for this service.

APPENDIX D

SOURCE ALPHA-NUMERIC DATABASES.

TIMESHARING COMPUTER SERVICE BUREAUS SPECIALIZING IN

INFORMATION RETRIEVAL SERVICES

Introductory Note

Tables D.1, D.2 and D.3 outline the database offerings of three major international vendors: I.P. Sharp Associates Ltd., Data Resources Inc. (DRI) and General Electric Information Services Company (GEISCO). I.P. Sharp is a privately-owned Canadian company headquartered in Toronto; DRI is a wholly-owned subsidiary of McGraw-Hill Inc. and GEISCO is the wholly-owned information services subsidiary of General Electric.

All three vendors started as timesharing computing service bureaus and timesharing usage still provides an important share of their revenues. Online databases and information retrieval services were added in the 1970s, to add value to timesharing usage. All three vendors operate private data communications networks linking the North American, European and Far Eastern markets to their central computers located in Toronto, Lexington (Mass.) and Cleveland respectively.

I.P. Sharp provides local calling access, from some 600 cities and towns, to 90 databases containing more than 25 million time series. In 1982, the firm had total revenues of Cdn $51.6 million from some 6,000 customers worldwide. Data base distribution is estimated to account for over 25% of total company revenues.

DRI provides the focal point for McGraw-Hill's own online distribution network. It offers about 80 files through the proprietary network, DRINET. The files or databases contain macro-economic forecasts, as well as numerous databases for individual industries. Its customers are primarily the Fortune 500 companies, financial institutions and government agencies, both U.S. and foreign.

GEISCO, by far the largest of these three vendors, had revenues of U.S. $500 million in 1981 and $550 million in 1982. Some 6,000 customers worldwide were using the service, known as MARK III, at the end of 1982. The company expects value-added products and services to account for an ever-increasing share of its revenues and pure processing to account for a decreasing share. In 1970, 15% of revenue came from value-added products. By 1981, the figure had risen to some 70% or $350 million. GEISCO expects such services to account for 90% of its revenues in the late 1980's.

Notes: Symbols used in Tables D.1, D.2, D.3

1. Type of Database

R = References, S = Source

B = Bibliographic, R = Referral

N = Numeric, T = Textual - Numeric, F = Full Text, P = Properties

2. Database Subject/Area

Major Disciplines:

B & I = Business and Industry

S & T = Science and Technology

SS & H = Social Science and Humanities

M = Multidisciplinary

Sub-area:

Indicated within brackets below the major discipline, e.g. Economics, Finance, Energy.

3. Update Frequency

D = Daily

W = Weekly

M = Monthly

Q = Quarterly

A = Annually

C = Continuous

4. Sources

Directory of Online Databases

Cuadra Associates, Vol. 3, No. 1, Fall 1981

Public Databases Catalogue

I.P. Sharp Associates Ltd., December 1981

Table D.1: Databases distributed by I.P. Sharp Associates Ltd.

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| AEA (Association of European Airlines) | S(N) | B&I (Aviation) | Member airlines of the AEA, from own data | 175,000 | M/A | No (Membership) |
| AISL (Aircraft Accident Database) | S(T) | " | Aviation Information Services Ltd., U.K. | - | As available | No |
| COAND (Commuter Online Origin Destination) | S(N) | " | U.S. Civil Aeronautics Board (CAB) | - | Q | No |
| COPS (Canadian Operating Statistics) | " | " | Statistics Canada | 2 Tables | Q | No |
| ER586 (ER586 Service Segment) | " | " | U.S. Civil Aeronautics Board (CAB) | 10,000,000 + | M | No |
| FORM41 | " | " | U.S. Civil Aeronautics Board (CAB) | 500,000 | M/Q | No |
| IATA (IATA North Atlantic Traffic) | " | " | IATA, from data filed by member carriers | 16 Tables | Discontinued | No |
| ICAO (ICAO Traffic Statistics) | " | " | International Civil Aviation Organization | - | A | No |
| INS (U.S. International Air Travel Statistics) | " | " | U.S. Depts. of Transport, Justice and INS | 2,000,000 | M | No |
| OAG2 (Official Airline Guide) | " | " | Official Airlines Guide Inc., USA | 3,000,000 + | M | No |
| OAND (Origin - Destination Survey) | " | " | U.S. Civil Aeronautics Board (CAB) | 3 Tables | Q | No |
| T6 (Aircharter Flights from/to U.S.) | " | " | U.S. Civil Aeronautics Board (CAB) | - | Discontinued | No |
| API (Weekly Statistical Bulletin) | S(N) | B&I (Energy) | American Petroleum Institute, USA | 500 | W | No |

Table D.1: Databases distributed by I.P. Sharp Associates Ltd. (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| ARGREP (Petroleum Argus Daily Market Report) | S(T) | B&I (Energy) | Europ-Oil Prices, U.K. | 50 Reports | D | U.S. $1250 Annual |
| ARGUS (Petroleum Argus) | S(N) | " | Europ-Oil Prices, U.K. | 2 Tables | D | U.S. $25/ month |
| DOE (Monthly Petroleum Statement) | " | " | U.S. Dept. of Energy (U.S. DOE) | 4,500 | M | No |
| HFO (Heavy Fuel Oils) | " | " | U.S. Dept. of Energy (U.S. DOE) | 8 Tables | M | No |
| IMPORTS (U.S. Petroleum Imports) | " | " | American Petroleum Institute, from U.S. DOE | - | M | U.S. $200/ year |
| IPA (International Petroleum Annual) | " | " | U.S. Dept. of Energy (U.S. DOE) | 1,500 | Discon-tinued | No |
| LPGAS (Liquefied Petroleum Gas Report) | " | " | American Petroleum Institute | 100 | M | No |
| MER (Monthly Energy Review) | " | " | U.S. Dept. of Energy (U.S. DOE) | Tables | M | No |
| MPSR (Monthly Petroleum Statistics Report) | " | " | U.S. Dept. of Energy (U.S. DOE) | 750 | M | No |
| QOS (OECD Quarterly Oil Statistics) | " | " | Organization for Economic Cooperation and Development | 1,000 | Q | No |
| SD (Monthly Supply and Disposition Report) | " | " | U.S. Dept. of Energy (U.S. DOE) | 2,500 | M | No |
| SEDS (State Energy Data System) | " | " | U.S. Dept. of Energy (U.S. DOE) | 10,000 + | As available | No |
| UKET (United Kingdom Energy Trends) | " | " | U.K. Dept. of Energy | Tables | M | No |

Table D.1: Databases distributed by I.P. Sharp Associates Ltd. (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| ABSDATA (Australian Bureau of Statistics Database) | S(N) | B&I (Economics) | Australian Bureau of Statistics (ABS) | - | Q | No |
| AES (Australian Economic Statistics) | " | " | The Reserve Bank of Australia (RBA) | 1,200 | As data published | No |
| BIHIST (Business Historical International Data) | " | " | Business International Corporation, USA | 14,000 + | A | No |
| CANSIM (Mini Base and Supplement) | " | " | Statistics Canada | 60,000 | D | No |
| COMERT2 (Australian Sector Cash Flow) | " | " | Comert Business Economists Ltd., Sydney | - | Q | No |
| DRI CAP (DRI Capsule, replaces NBER Database) | " | " | Data Resources Inc., USA | 3,800 | M | No |
| IFS (International Financial Statistics) | " | " | International Monetary Fund (IMF) | 28,000 | M | No |
| IOA (Australian Input-Output Database) | " | " | Australian Bureau of Statistics | 27 I/O Tables | As available | No |
| NPAECO (National Planning Associates Economic Data) | " | " | National Planning Association, USA | 200,000 + | A | No |
| OECD (Main Economic Indicators, QNA, ANA) | " | " | Div. of Statistics, Economic and National Accounts, OECD | - | M | No |
| UKCSO (U.K. Central Statistical Office) | " | " | U.K. Central Statistical Office (UKCSO) | 2,000 | M | No |
| USCPI (U.S. Consumer Price Index-disaggregated) | " | " | U.S. Bureau of Labour Statistics (BLS) | 8,700 | M | No |

Table D.1: Databases distributed by I.P. Sharp Associates Ltd. (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| USPPI (U.S. Producer Price Index - dis-aggregated) | S(N) | B&I (Econom-ics) | U.S. Bureau of Labour Statistics (BLS) | 5,200 | M | No |
| WDEBT (World Bank Debt Tables) | " | " | International Bank for Reconstruction and Development (IBRD) | 1,050 | A | No |
| AGDATA (Agricultural Commodities) | " | B&I (Fi-nance) | Alberta Agriculture, Economic Services Division | - | W | No |
| ARATE (Australian Bank Bill Rates) | " | " | Australian Merchant Bankers Association | - | D | No |
| ASE (Australian Stock Exchange Indices) | " | " | Sydney Stock Ex-change (Association of Australian Stock Exchanges) | - | D | No |
| AUSTCOM (Australian Commodities) | " | " | International Commodities Clearing House | - | D | No |
| CANOPT (Canadian Stock Options) | " | " | Toronto Stock Exchange (TSE) | - | D | No |
| CBOND (Canadian Band Market) | " | " | Wood Gundy Ltd., Toronto | 6,000 +, Facts | W (Fridays) | No |
| COMERT1 (Australian Financial Database) | " | " | ABS, RBA | - | M | No |
| COMERT2 (Australian Funds Market) | " | " | Comert Business Economists Ltd., Sydney | - | A | Subs. regd. |
| COMMBOND (Common-wealth Bond Index) | " | " | Commonwealth Bank, Sydney | 70 | W (Fridays) | No |
| COMMOD (Commodities Traded on Futures Markets) | " | " | Eurocharts Ltd. | - | D | No |

Table D.1: Databases distributed by I.P. Sharp Associates Ltd. (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| CURRENCY (Currency Exchange Rates) | S(N) | B&I (Finance) | °Bank of England (London)<br>°Bank of Nova Scotia (Toronto)<br>°Federal Reserve System (New York)<br>°Creditanstalt - Bankverien (Vienna)<br>°Swiss Bank Corp. (Zurich)<br>°Australian and New Zealand Bank Group (Melbourne)<br>°La Bourse de Paris (Paris)<br>°Deutsche Bundesbank (Frankfort)<br>°Den Danske Bank (Copenhagen) | - | D | No |
| EXSTAT (Exstat Corporate Database) | " | " | Extel Statistical Services Ltd., U.K. | - | M | U.S. $2000/ year |
| FPCORP (Financial Post Canadian Corporate Database - 470 companies) | " | " | Financial Post, Investment Databank | 80,000 + | As available | No |
| FPSTOCK (Financial Post Securities) | " | " | Financial Post, Investment Databank | - | D | No |
| MBANK (Canadian Chartered Banks, Monthly Assets, Liabilities) | " | " | Dept. of Finance/ Canada Gazette, from reports by chartered banks | - | M | No |
| MRATE (Money Market Rates) | " | " | °Financial Times (London)<br>°Globe and Mail (Toronto)<br>°Wall Street Journal (New York) | - | D | No |

Table D.1: Databases distributed by I.P. Sharp Associates Ltd. (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| QBANK (Canadian Chartered Banks, Quarterly) | S(N) | B&I (Finance) | Canadian Chartered Banks, quarterly statements | - | Q | No |
| STATEX (Sydney Stock Exchange Statex Service) | " | " | Sydney Stock Exchange Research Dept. | 35,000 + | Q | No |
| TSE300 (TSE 300 Composite Index) | " | " | Toronto Stock Exchange (TSE) | 8,600 | D | No |
| USOPT (U.S. Stock Options, daily trading statistics) | " | " | All major U.S. Stock Exchanges | - | D | No |
| WBANK (Bank of Canada Weekly Financial Statistics) | " | " | Bank of Canada | 215 | W | No |
| YBANK (Canadian Chartered Banks, Annual) | " | " | Canadian Chartered Banks, Annual Reports | 500 + | A | No |
| ACT (Actuarial Database, Primitive Mortality Information) | " | B&I (Insurance) | I.P. Sharp, from published actuarial tables | Tables | At users' request | No |
| CDI (Cdn. Dept. of Insurance, financial information on 660+ federaly registered insurance and trust companies) | | | Dept. of Insurance ("The Blue Book") | - | A | No |
| APLLIB (APL Bibliography) | R(B) | S&T (Computers) | I.P. Sharp | - | As required | No |
| NEELS (National Emergency Equipment Locator System) | R(R) | S&T (Environment) | I.P. Sharp, under direction of DOE, MOT and Petroleum Association for Conservation of the Canadian Environment | - | As required | No |

Table D.2: Databases distributed by Data Resources, Inc. (DRI)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| AGRICULTURE | S(N) | B&I (Agri-culture) | DRI | - | C | Subs. to DRI + Database |
| BALANCE OF PAYMENTS | " | B&I (Fin.-Int) | International Monetary Fund (IMF) | 43,000 + | M | " |
| BEST EXECUTIVE DATA | " | B&I (In-surance) | A.M. Best Co. | 1,900 Insurers | A | Subs. to DRI + BEST |
| CALIFORNIA DATABANK | " | B&I (Econ - U.S.) | Security Pacific National Bank (SPNB) | 35,000 + | D | $4000/year to SPNB |
| CANADA (includes Mini CANSIM) | " | B&I (Econ - Can) | DRI and Statcan CANSIM Division | 25,000 + | D | Subs. to DRI + Database |
| CANADIAN INSURANCE | " | B&I (In-surance) | DRI and Statcan | 3,000 | C | Subs. to Ins. Service |
| CANSIM (MINI BASE) | " | B&I (Econ - Can) | Statistics Canada CANSIM Division | 20,000 | D | - |
| CHEMICAL DATA BANKS | " | B&I (Chem-icals) | DRI | | C | Subs. to Chem. Service |
| COAL DATA BANKS | " | B&I (Energy) | U.S. Department of Energy (US DOE) | 4,000 | C | Subs. to Coal Service |
| COAL MODEL DATA BANKS | " | " | DRI - coal model estimates/forecasts | 300 + | C | Subs. to DRI Coal Service |
| COMMODITIES MARKET DATA BANK | " | B&I (Commod) | DRI | 18,000 + | D | Avail. to all DRI subs. |

Table D.2: Databases distributed by Data Resources, Inc. (DRI) (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| COMPUSTAT (covers U.S. and Canada) | S(N) | F&I (Finance) | Standard and Poor's Compustat Services Inc. | 6,000 companies | W | Subs. to S+P reqd. |
| CONFERENCE BOARD | " | B&I (Econ. - U.S.) | The Conference Board, Inc. | | | $450-600/ year to CB |
| CONSUMER EXPENDITURE SURVEY (1972-73) | " | " | U.S. Census Bureau (for Dept. of Labour) | Survey of 40,000 | - | Subs. to DRI |
| COST FORECASTING DATA BANKS | " | " | DRI | - | C | Subs to DRI CFS reqd. |
| CURRENT POPULATION SURVEY | " | SS&H (Demog.) | U.S. Census Bureau | - | A | - |
| DEVELOPING COUNTRIES PRIMARY SOURCE DATA BANK | " | B&I (Econ. - Int.) | DRI (main economic indicators) | - | C | Subs. to DRI + Database |
| DIRECTION OF TRADE DATA BANK (160 countries) | " | B&I (Trade - Int.) | International Monetary Fund (IMF) | 52,000 + | M | Subs. to DRI + Database |
| DRI INDUSTRY FINANCIAL SERVICE DATA BANK (DRIFS) | " | B&I (Fin. - U.S.) | DRI | 81 industries, 600 companies | C | Subs. to DRIFS reqd. |
| DRI-CEI (Current Economic Indicators for 20 countries) | " | B&I (Econ. - Int.) | DRI (10-20 key economic indicators/ country) | - | D,M | - |
| DRI - FACS (U.S. Financial Statistics) | " | B&I (Fin. - U.S.) | DRI (from Federal Reserve and Treasury releases) | - | D | Subs. to DRI FACS reqd. |
| DRI - SEC (Securities Data Bank) | " | B&I (Securities) | DRI and Telstat Systems Inc. | - | D | Subs. to DRI reqd. |
| EAST ASIAN DATA BANK | " | B&I (Econ. - Int.) | DRI | 3,000 | C | Subs. to DRI + Database |

Table D.2: Databases distributed by Data Resources, Inc. (DRI) (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| EML/DIADEM (Databases/ Models for auto industry, energy) | S(N) | B&I (Auto, Energy) | Economic Models Ltd. | - | C | Subs. reqd. |
| ENERGY DATA BANK | " | B&I (Energy) | DRI | 22,000 | C | Subs. to DRI + Database |
| EUROPEAN NATIONAL SOURCE DATA BANK | " | B&I (Econ. - Int.) | DRI, INSEE, IFO, CSO (U.K.) | - | C | " |
| FIEI (Farm and Industrial Equipment Institute) | " | B&I (Equip- ment) | Farm and Industrial Equipment Institute | - | C | Subs. to DRI, membership |
| FLOW OF FUNDS | " | B&I (Fin. - U.S.) | Federal Reserve Board (FRB) | 3,600, 50 sectors | Q | - |
| FORESTRY DATA BANKS | " | B&I (For. Prod.) | DRI, from BLS and Product Associations | - | C | Subs. to DRI FPS reqd. |
| IFS (International Financial Statistics) | " | B&I (Fin. - Int.) | International Monetary Fund (IMF) | 17,000 + | M | - |
| INSURANCE SERVICE DATA BANK | " | B&I (In- surance) | DRI | - | C | Subs. to DRI Ins. Service |
| INTERNATIONAL TRADE INFORMATION (ITIS) | " | B&I (Trade - Int.) | DRI and OECD (Trade Statistics for OECD members) | 2,000,000 + | A | Subs. to DRI ITIS reqd. |
| LATIN AMERICAN DATA BANK | " | B&I (Econ. - Int.) | DRI, from official sources in selected countries | - | C | Subs. to DRI reqd. |
| NEW YORK CITY MODEL DATA BANK | " | B&I (Econ. - U.S.) | DRI | - | C | Subs. to DRI NYMAS reqd. |

Table D.2: Databases distributed by Data Resources, Inc. (DRI) (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| NIKKEI ECONOMIC STATISTICS | S(N) | B&I (Econ. - Japan) | NIKKEI (Nihow Keizai Shimbun) | 6,000 + | M | Subs. to DRI in N.A. |
| NIKKEI ENERGY DATA BANK | " | B&I (Energy) | " " | 2,400 | M | " |
| OECD INTERNATIONAL (MEI, QNA, ANA, LF, etc.) | " | B&I (Econ. Trade) | OECD | 15,000; 25 countries | C | Subs. to DRI reqd. |
| OIL AND GAS DRILLING DATA BANKS | " | B&I (Energy) | DRI | 4,500 | C | Subs. to DRI OGDS reqd. |
| PAPER AND PULP DATA BANKS | " | B&I (Pulp & Paper) | DRI | 5,000 | C | Subs. to P+PS reqd. |
| PLATT'S DATA BANK | " | B&I (Energy) | McGraw-Hill Inc. | - | C | Subs. to DRI and Platts |
| SITE II | " | SS&H (Dem. - Pop.) | CACI Inc., based on 1980 U.S. Census | 60,000 Tracts/Div. | A | Royalty Surcharge |
| SITE POTENTIAL | " | B&I (Econ. - U.S.) | CACI Inc., from Census Bureau Data | - | A | - |
| SMRB (Simmons Market Research Bureau) | " | B&I (Cons., Mktg.) | Simmons Market Research Bureau Inc. | 2 databases (SMM, STARS) | A, 3A | Subs. to SMRB reqd. |
| STANDARD & POOR'S INDUSTRY FINANCIAL DATA BANK | " | B&I (Fin. - U.S.) | Research Bureau Inc. DRI and S&P | 1,800 +; 100 industry groups | C | Subs. to DRI and S&P publica-tions |
| STEEL DATA BANKS | " | B&I (Steel) | DRI | - | C | Subs. to DRI Steel Service |

Table D.2: Databases distributed by Data Resources, Inc. (DRI) (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| SUMMARY DODGE CONSTRUCTION POTENTIALS | S(N) | B&I (Const. | McGraw-Hill Information Systems Co. F.W. Dodge Div. | 200 + types projects | D | Subs. to DRI CAS reqd. |
| TARGET GROUP INDEX | " | B&I (Const., Mktg) | Simmons Market Research Bureau Inc. | 3 Market Research DBS | D | Subs. to SMRB reqd. |
| TRANSPORTATION | " | B&I (Trans-port) | DRI | - | C | Subs. to DRI Trans-port Serv. |
| TRANSPORTATION COST SERVICE (TCS) | " | B&I (Trans-port) | A.T. Kearney Inc. | - | Q | Subs. to DRI reqd. |
| U.S. CENTRAL | " | B&I (Econ. - U.S.) | DRI from BEA, CB, BLS, FRB, etc. data | - | C | " |
| U.S. COUNTY | " | " | DRI, using BEA data | 200,000 + | A | Subs. to DRI and Database |
| U.S. MODEL DATA BANK | " | " | DRI, using data from govt. agencies | 1,100 | C | Subs. to DRI USMS reqd. |
| U.S. PRICES DATA BANK | " | " | DRI and BLS | 17,200 | M | Subs. to DRI reqd. |
| U.S. REGIONAL | " | " | DRI, from Federal and State Agencies | 42,000 | C | Subs. to DRI and Database |
| VCLA BUSINESS FORECASTING PROJECT DATABASES | " | " | UCLA, Bus. Forecast-ing Project, School of Management | 120 | Q | Subs. to CSES reqd. |
| VALUE LINE (major companies on NYSE, AMEX) | " | B&I (Fin. - Corp.) | Arnold Bernhard and Co., (Value Line Data Services) | 400,000 + | C (Q,A) | $5500 subs. or 8% surch. |
| WORLD DEBT TABLES (Public Debt, 97 countries) | " | B&I (Fin. - Int.) | DRI for DRI, from World Bank Data | - | C | Subs. to DRI and Database |

Notes: Subject to the appropriate conditions, the above databases are available to Canadian users through DRI Canada Ltd.

Table D.3: Databases distributed by
General Electric Information Services Company (GEISCO)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| AQUA | S(P) | S&T (Chemistry) | Institution of Chemical Engineers, U.K. | - | A | - |
| BI/DATA (Int. Time Series, covers 131 countries) | S(N) | B&I (Econ. - Int.) | Business International Corporation (BI) | 20,000 + | D, as available | $480/year |
| CITIBASE (Economic Database) | " | B&I (Econ. - U.S.) | Citibank, Citibase Economic Database | 4,200 + | D, M | $115 + $100-130/ month |
| COMMODITIES FUTURES | " | B&I (Commod) | Market Data Systems Inc. | | D | - |
| CONSUMER PROSPECTUS | S(T) | B&I (Consumers) | The Futures Group | 100 + Consumer indicators | M, A | $11,000/yr to FG |
| CURRENCY EXCHANGE DATA BASE (56 countries) | S(N) | B&I (Curr. Rates) | International Marine Banking Co. and IMF | - | D (Twice) | - |
| DWIGHT'S ENERGYDATA OIL AND GAS PRODUCTION | S(T) | B&I (Energy) | Dwights Energydata Inc. | 400,000 gas wells/oil leases | Q | Subs. to De reqd. |
| E.H. BOECKH COMPUTERIZED BUILDING COST ESTIMATING | S(N) | B&I (Construction) | E.H. Boeckh Co. (Covers U.S., Canada) | - | M | - |
| EMIS (Electronic Materials Information Service) | S (T, P) | S&T (Chem, Elect) | Institution of Electronic Engineers, U.K. | 2 Files | D | - |
| FAPRS (Federal Assistance Programs Retrieval System) | R(R) | M (Fund., Awards) | U.S. Office of Management and Budget (OMB) | 1050 programs | M | - |
| FPR (Fast Permit Reports) | S(T) | B&I (Energy) | Petroleum Information Corporation | - | D | - |
| FTCDATA | S(N) | B&I (Fin. - Corp.) | GEISCO | 496 | Q | - |

Table D.3: Databases distributed by
General Electric Information Services Company (GEISCO) (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| INDUSTRIAL BANK OF JAPAN | S(N) | B&I (Fin. - Corp.) | Industrial Bank of Japan, Ltd. | 3,500 | A | Access surcharge |
| MARDATA (Maritime Data Network) | S(T) | B&I (Maritime) | Maritime Data Network Ltd. | 3 Libraries | D to 60 days | Annual subs. $1000-4000 |
| MINERALS DATA SYSTEM (MDS | S(T) | S&T (Earth Sci.) | Univ. of Oklahoma, for U.S. Geological Survey | 45,000 +; 96 countries | C | - |
| NASA STANDARD/ AVAILABLE FLIGHT QUALIFIED EQUIP. | R(R) | S&T (Aeronaut.) | NASA, Standard/ Available Flight Qualified Equip. | - | Irregularly | - |
| NEMA (National Electrical Manufacturers Association) | S(N) | B&I (E + E) | National Electrical Manufacturers Assoc. | - | Q | Permission from NEMA |
| NRI/E JAPAN ECONOMIC AND BUSINESS DATA BANK | " | B&I (Econ. - Japan) | Nomura Research Institute (NRI) | 3,500 | C | $1500 to NRI |
| ORR SYSTEM (of Construction Cost Management) | " | B&I (Const.) | Cost System Engineers, Inc. | 2,200 projects 45,000 items | Q | $0.15 per equiv. line item |
| PDS (Petroleum Data System) | S(T) | B&I (Energy) | Univ. of Oklahoma, for U.S. Geological Survey | 80,000 pools and fields | C | - |
| PETROLEUM ARGUS | S(N) | " | Europ-Oil Prices | | | $300 Annu. Subs. |
| PHARMACEUTICAL PROSPECTUS | S(T) | B&I (Pharm.) | The Futures Group, and IMS America Ltd. | 120 + indicators | Bimonthly | $11,000 Ann. Subs. |
| PPDS (Physical Properties Data System) | S(P) | S&T (Chemistry) | Institution of Chemical Engineers, U.K. | - | - | Access Surcharge |
| SIC (Business Activity by Industry Classification) | S(N) | B&I (Econ. - U.S.) | U.S. Dept. of Commerce | 5,000 | Discontinued | - |

Table D.3: Databases distributed by
General Electric Information Services Company (GEISCO) (Continued)

| Database Name | Type | Subject | Information Producer/Source | Approx. No. of Time Series | Update Frequency | Surcharge/ Subscrip. |
|---|---|---|---|---|---|---|
| SIC72 | S(N) | B&I (Econ. - U.S.) | U.S. Dept. of Commerce | 5,000 | Discon-tinued | - |
| SITE II | " | SS&H (Dem. + Pop.) | CACI Inc., based on 1980 U.S. Census | 60,000 Tracts/Div. | A | Royalty surcharge |
| SITE POTENTIAL | " | B&I (Econ. - U.S.) | CACI Inc., from Census Bureau Data | - | A | - |
| STASID (Oil + Gas Exploration/production stats.) | " | B&I (Energy) | S.N. Elf Aquitane | 250 countries/ regions | A | - |
| TELSAT (Securities and Municipal Bonds) | " | B&I (Secu-rities) | Telstat Systems Inc. | 30,000 sec; 1.5m bonds | D to M | ? |
| UCLA BUSINESS FORECAS-TING PROJECT DATABASES | " | B&I (Econ. - U.S.) | UCLA, Bus. Forecas-ting Project, School of Management | 300 + | Q, A | $950 - $3,000 |
| VALUE LINE (major companies on NYSE, AMEX) | " | B&I (Fin. - Corp.) | Arnold Benhard & Co. (Value Line Data Services) | 400,000 + | C (Q, A) | $5,500 subs. or 8% surch. |

Notes: Subject to the appropriate conditions, the above databases are made available through the Information Services Division of Canadian General Electric to users of the MARK III Service in Canada.

APPENDIX E

# REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

## VIDEOTEX (TELIDON) BASED SERVICES

TABLE OF CONTENTS

## A. VIDEOTEX SERVICES: CURRENT AND PLANNED

### 1. Overview

Videotex is still in its infancy in terms of market penetration and service availability. However, it is encouraging, if not surprising, to note the high number of businesses and organizations involved in videotex at this early stage in its development. LINK's International Videotex Directory[1] lists 41 system operators (eg. Bell Canada, Prestel Headquarters, Times-Mirror Videotex Services, Bildschirmtext, Direction Générale des Télécommunications, etc.); 41 manufacturers of terminal equipment (eg. Norpak, Standard Telephone and Cables, Tandy, Dornier System, Intelmatique, etc.); 19 marketing turnkey systems (eg. Infomart, Nippon Electric, Computex); 14 software houses (eg. Bell Northern Research, Langton Information Systems, Logica); 11 umbrella IPs (eg. Infomart, Information Services and Equipment Ltd., Viewdata Corporation of America); 5 trade associations (eg. Videotex Information Service Providers Association of Canada (VISPAC), Electronic Media Committee/Information Industry Association); 14 consultancies and research (eg. Butler Cox, International Resource Development Inc., Interdiscom Systems Ltd.); and over 800 content providers, which represents a partial rather than a comprehensive list. The growing interest from both the public and private sectors internationally would indicate that the videotex industry is bound to continue to develop. How quickly this development takes place, however, is another matter. A list of current and planned videotex services can be found in Section B of this Appendix.

In Canada, the availability and variety of videotex services is increasing. The Vista, B.C. Tel, Elie, and Mercury projects are presently offering basic fare for the residential user: news, consumer information, yellow pages, and general information of a local nature. The OECA trial is an educational application of Telidon using broadcast teletext. The Task Force on Service to the Public offers information about federal government departments and agencies on Telidon terminals located in experimental service bureaus across the country. Teleglobe Canada is piloting a database supplying Canadian information internationally, called Novatex, which is expected to compete with Prestel International. There are two commercial videotex services in Canada: Grassroots serving the agribusiness community of southern Manitoba and Videopress delivering information and advertising to mall-shoppers in London, Ontario. Project IRIs is a CBC teletext trial scheduled to begin in 1982 in Montreal, Toronto and Calgary. Infomart is planning the Visitor's Guide for Toronto which will make information about the city available in 2,000 public locations. A trend toward more diverse and innovative applications of videotex would appear to be emerging.

The list of Canadian videotex services promises to grow longer in 1982 due to an announcement by Francis Fox that 52 Telidon projects have qualified to receive a total of $9.5 million in assistance under the Telidon Industry Investment Stimulation Program. Among the proposed application are those geared towards agricultural, fisheries, and business users; those offering education and health services, and tourist and entertainment information.

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1. Videotex Monitoring Services: LINK Resources Corporation, 1981.

In addition, the CRTC recently decided to permit a two-year trial of commercial services over certain cable networks, enabling Vancouver Cablevision to announce plans for a major trial of a variety of new bi-directional communications services, including teleshopping and telebanking, and Vidéotron to go ahead with its planned videotex experiment, Service d'Information à Domicile (SID). Most of the Telidon trials currently underway in Canada are using telephone transmission lines. Plans by Vancouver Cablevision, and Télécâble Vidéotron for its SID experiment can be expected to add still another dimension to the development of videotex in Canada.

## 2. Descriptions of Some Representative Examples

Following are brief descriptions of a few representative examples of current and planned videotex services.

### VISTA

A total of 491 user terminal locations in Toronto and Cap Rouge, near Quebec City will be tested in 1981 and 1982. Bell Canada is Vista's system operator and transmission is by dedicated telephone circuit. The type of information available includes: news, consumer advice, games, weekly specials, advertising, general information and Teledirect Yellow Pages. Users receive these services free of charge for the duration of the field trial.

### GRASSROOTS

A joint undertaking of the Manitoba Telephone System and Infomart, the Grassroots project is a commercial service providing up-to-the-minute specialized information to the agribusiness community of southern Manitoba. The trial started in May 1981 with 50 terminals: one public terminal in each of 25 farming communities, and one in each of 25 private households. The private terminals are rotated every 60 days, after which the user can either choose to pay the subscription or give up the terminal. In October 1981 the Economist reported 350 users with a rate of 15 a month being added. Telidon terminals can be leased from Manitoba Tel for $47.50 per month and at a rate of $0.05 per minute to access Grassroots information. IPs are charged $1. per day per page for storage. The service currently offers information from the following sources: Winnipeg Commodities Exchange, World Weatherwatch, Manitoba Department of Agriculture, Manitoba Cattle Producers, Canadian Grain Commission, Herald Grain, Agriculture Canada, Monsanto, Bank of Montreal, Royal Bank, University of Manitoba, Brandon University, Northern Sales, Cargill Grain, Canadian Wheat Board, and Manitoba Hog Marketing Board.

### VISITORS GUIDE

Infomart is scheduled to operate a commercial system of 2,000 Telidon Terminals located in public places throughout Toronto beginning in the summer of 1982. The system will provide free public access to current information about places, activities and services in Toronto. IPs will purchase pages on the system. The Ontario Government will allocate up to $5 million for the $11 million project, which is expected to be in full commercial operation and supported by the private sector by mid-1983.

### INDAX

Cox Cable developed a two-way cable system that permits a sample of its cable subscribers in San Diego to access interactive services like banking and shopping at home, and information retrieval from local and national sources. The HomServe Bank transactions are included in the INDAX tier, which replaces the ordinary television converter with a terminal supplied by Oak Industries. Neilsen is conducting the research. INDAX relies on the Source to supply the core of its information retrieval offerings.

## DOW JONES NEWS RETRIEVAL SERVICE

Customers are both businesses and consumers in Canada and the U.S., and the service is transmitted by Tymnet, Telenet, and private line distributors. The services include News Data Base, Stock Quote Reporter Service, Historical Stock Quote Reporter, Disclosure Outline (corporate profiles), Media General Financial Database and Money Market Services.

## AT&T PLP

CBS will furnish all the information for this trial, and AT&T will supply computer equipment and transmission facilities. The 200 Ridgewood households selected will be provided free access to continually updated local and national news, weather, sports, education entertainment, electronic banking and shopping in two 3-month phases, each with 100 users.

## TELETEL

Three hundred of the total 2,500 users in the 18-month trial will be equipped with a "smart card" containing a 4,000 word memory as an aid to interactive service. The gateway concept employed permits users to access existing third-party databases and almost 200 organizations to contribute to the database. Services include railway timetable information, reservation service, news, electronic mail box, legal information and promotional material.

## PRESTEL

The Prestel commercial service in the U.K. has been in operation for three years and has 13,000 users. It is open to any IPs willing to pay for space on the system. Customers seeking access to the information pay telephone charges, computer usage rates, plus charges levied by IPs. The average running cost for the customer is $12 per hour. The market has grown in the travel business and for commodity prices. Prestel is used in both homes and businesses. Its services include, for example, Intercom Videotex (continually updated market prices, TOPIC (current information for the professional investor and stock-broker), ABC Travel Guides, and Fintel Company Newsbase.

## BILDSCHIRMTEXT

Trials in Berlin and Dusseldorf, now with 3,700 of 6,000 expected users, have been operation since 1980. The monthly subscription rate is $2.50 plus telephone charges and IP page charges. IPs pay for all their costs of service operations. The Bildschirmtext system uses Prestel technology. The Gateway technology permits, for example, home terminals to link with computers in banks so that users can access their bank statements. The trial is now geared toward the business market but its public service, Bildschirmtext CEPT, will be launched in 1982.

## CAPTAINS

Since December 1979 Japan has been running a 1,000-terminal trial in Tokyo of the Captain videotex system, which was designed to accommodate the presentation of Japanese text. A full commercial service is not expected before the end of 1983. The services are geared toward the residential consumer market. There are over 165 IPs including newspapers, advertising agencies, broadcasters, banks, public utilities and research and consulting services. Users pay for connect time and the TV adaptor. IPs pay compiling and editing costs as well as service centre facility rates.

## VIDITEL

The Dutch PTT's videotex service is already in commercial operation. It's 4,000 users are charged $0.10 per minute (half that charge for evening use). IP's must provide 1 terminal for every 50 frames reserved for storage. The system is designed along the same lines as Bildschirmtext. The service being offered are very much like those of Prestel and the publishing business in Holland is heavily involved.

## B. VIDEOTEX OPERATIONS

### 1. COMMERCIAL VIDEOTEX SERVICES

#### CANADA

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| Manitoba Tel./ Infomart | Project Grassroots* | May 1981 | Manitoba | 350+ |
| London Free Press/ Cable Share | Videopress | December 1981 | London, Ontario | 3** |

#### USA

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| Dow Jones | News/Retrieval Service* | 1977 | United States, Canada | 27,000 |
| CompuServe | CompuServe Information Service | July 1979 | United States | 12,000+ |
| Source Tele-computing | The Source | June 1979 | United States, Canada, Australia | 11,500+ |
| Belo | BISON | July 1981 | Dallas, TX | 77 |

#### EUROPE

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| British Telecom | Prestel* | October 1978 | UK | 13,000 |
| Telesystems | Videotel | July 1981 | France | 2,700 |
| | Eurodial | 1979 | France | 100 |
| | Questel | July 1981 | France | ? |
| Helsingin Telset Oy | Telset | 1978 | Helsinki | 200+ |
| VNU/TVS | TV | 1980 | Amsterdam | 50 |
| Dutch PTT | Viditel* | August 1981 | Netherlands | 4,000 |

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* Experiments and services marked with an asterisk are described briefly in the preceding section.

** Terminals.

## 2. CURRENT VIDEOTEX TRIALS

### CANADA

PUBLIC SECTOR

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| Bell Canada/DOC | Project Vista* | May 1981 | Toronto/Quebec City | 491 |
| New Brunswick Telephone Co. | Project Mercury | April 1981 | St. John, N.B. | 45 |
| Manitoba Telephone Co. | Project ELIE | October 1981 | Elie, Manitoba | 150 |
| OECA | Telidon | January 1980 | Ontario | 55 |
| Task Force on Service to the Public | Telidon Project | April 1981 | Canada | 30** |
| Teleglobe Canada | NOVATEX | September 1981 | International | 19** |
| BC Tel | Telidon Trial | November 1981 | Vancouver | 125 |

### USA

PRIVATE SECTOR

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| HomServe/Cox Cable | INDAX* | 2nd quarter 1981 | San Diego, CA | 50 |
| Dow Jones | ? | June 1979 | Las Colinas, TX | 8 |
| First Interstate Bank | Day & Night Video Banking | October 1981 | San Fernando Valley, CA | 250 |

PUBLIC SECTOR

| | | | | |
|---|---|---|---|---|
| Alternate Media Centre/PBS | WETA/AMC Teletext Trial | June 1981 | Washington, DC | 50 |

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** Terminals.

## EUROPE

### PRIVATE SECTOR

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| Swedish Businesses | Datavision | 1981 | Stockholm | 25 |
| Oy Turum Sanomat | Telset | March 1981 | Turku, Finland | 30 |
| Tampere | Telset | March 1981 | Tampere, Finland | 70 |

### PUBLIC SECTOR

| | | | | |
|---|---|---|---|---|
| British Telecom | Prestel International | April 1980 | Seven Countries | 320 |
| French PTT | Electronic Directory | May 1981 | Ile-et-Vilaine | 1,200 |
| French PTT | Teletel* | April 1981 | Velizy | 2,500 |
| Swedish Telecommunications | Datavision | 1979 | Stolkholm | 30 |
| Norwegian Telecoms | Teledata | June 1979 | Oslo | 60 |
| Deutsche Bundespost | Bildschirmtext* | June 1980 | Berlin, Dusseldorf | 6,000 |
| Danish PTT | Teledata | January 1982 | Denmark | 200 |
| Austrian PTT | Bildschirmtext | March 1981 | Austria | 300 |
| Swiss PTT | Videotex | November 1979 | Berne | 100-150 |

## OTHER COUNTRIES

### PUBLIC SECTOR

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| Japanese PTT | CAPTAINS* | December 1979 | Tokyo | 1,000 |
| Hong Kong Telephone | Viewdata | Late 1980 | Hong Kong | ? |
| ? /Infomart | ? | Early 1981 | Caracas, Venezuela | 25 |

## 3. PLANNED VIDEOTEX TRIALS

### CANADA

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| Télécâble Vidéotron | Project HIS/SID | February 1982 | Montreal | 250 |
| CBC/DOC | Project IRIS | September 1982 | Montreal/ Toronto/ Calgary | 750 |
| Infomart | Visitors Guide* | Summer 1982 | Toronto | 2,000** |
| SaskTel | Pathfinder | June 1982 | Regina | 135 |

### USA

PRIVATE SECTOR

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| Frittsco/Infomart | ? | Late 1982 | San Joaquin CA | 300-500 |
| AT&T/CBS | AT&T/PLP* | September 1982 | Ridgewood, NJ | 200 |
| Times Mirror/ Infomart | ? | March 1982 | Southern California | 350 |
| Continental Telephone | ConTelVision | 1982 | Manassas, VA | 100 |
| Citibank | ? | 1981 | New York City | 100 |
| Chemical Bank | Project Pronto | ? | New York City | 200 |
| First Bank System | First hand | mid-1982 | North Dakota | 250 |

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** Terminals.

EUROPE

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| French PTT | Electronic Directory | 1982 | Ile-et-Vilaine | 250,000 |
| French Television and Telecommunications Research Centre | Perceval | ? | Belgium | ? |
| Swedish PTT | CEPT | Summer 1982 | Sweden | 350-500 |
| Teletieto Oy | Telset | 1981 | Finland, Six cities | ? |
| Deutsche Bundepost | Bildschirmtext CEPT* | 1982 | Ten cities | 40,000 |

OTHER COUNTRIES

PUBLIC SECTOR

| Operator | Service | Start-Up | Location | Users |
|---|---|---|---|---|
| TELESP | Antiope | 1982 | Sao Paulo, Brazil | 1,500 |

APPENDIX F

# REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

## THEMATIC APPROACH:

## INTERNATIONAL REVIEW OF GEOSCIENCE SOURCE AND REFERENCE DATABASES [1]

Prepared by:

Cornelius F. Burk, Jr.
Adviser, Information Resources
Geological Survey of Canada
Ottawa, Ontario K1A 0E8

1.  presented to AMF Seminar 154/81, Glenside, S.A., 30-31 March 1981; to be published, with permission, in Database (Online, Inc.), June 1982.

Note to Appendix F

The appendix has been included as a sample of addressing certain transborder data flow related questions on a thematic or subject basis. A study of this type had recently been completed by Dr. C.F. Burk, Jr. of the Canadian Centre for Geoscience Data, Energy, Mines and Resources Canada and made available by the author to the TBDF Task Force for inclusion in its Report on Public Online Services.

While this study was completed prior to commencement of the work of the Task Force, the information contained therein is still of value to the Report on Public Online Information Retrieval Sources.

In the area of online data bases in geoscience, the U.S. dominates with 57.1% with Canada second at 44.3% and the U.K., third with 11.4%. For other data bases the U.S. also dominates with 48.6% with Canada second at 21.6%, Australia third at 9.5% and with France and U.K. tied for fourth at 6.8% each.

The total number of 82 "source" data bases cited in the summary text is based on the fact that a number of entities are actually "systems" instead of single data bases. They are:

| Name | Number of databases |
|---|---|
| MINERALS DATA SYSTEM (MDS) (page 3) | 2 |
| NATIONAL COAL RESOURCES DATA SYSTEM (Page 5) | 2 |
| PETROLEUM DATA SYSTEM (PDS) (page 6) | 15 |
| NATIONAL COAL RESOURCES DATA SYSTEM (page 8) | 2 |
| TOTAL: | 21 |

There are thus 17 (21-4) more source data bases than entities appearing in the list.

# International Review of Geoscience Reference Databases

Cornelius F. Burk, Jr.
Canada Centre for Geoscience Data
Ottawa, Canada

## SUMMARY

Reference databases differ from the source databases previously described by directing users to sources of information, rather than providing it directly. Most commonly, reference databases describe information recorded in books and other traditional published works (hence they are usually called "bibliographic" databases), but they have also been created to identify a wide range of other information sources such as unpublished reports, records, theses, data collections, imagery and maps, geological materials (e.g. cores and samples), research activities, people - and even other databases. The term "reference database" conveniently embraces all such locator tools.

Because of the general need to control ever-growing volumes of literature and reports, the development of reference databases has proceeded steadily in numerous organizations since the early 60s. Since the basic nature and structure of entities in all reference databases, regardless of subject-matter, is identical or at least similar, there has been more scope and opportunity for developing standards, common data-handling techniques, and the development of networks and common objectives among related organizations, than has been the case for source databases.

Of the 46 public reference databases identified in this review, the largest number (37) in fact deal with literature and/or unpublished reports. Five are international in scope and attempt to cover most or all geoscience disciplines: GEOARCHIVE (UK), GEOREF (USA), JICIST (Japan), PASCAL (France) and VINITI (USSR). These also can be considered as national databases for the five countries producing them; in addition at least four other countries maintain national geoscience databases, namely AESIS (Australia), GEOSCAN (Canada), GEO-INDEX (Czechoslovakia) and GEOLOGICAL SCIENCE LITERATURE (West Germany). Others deal with geoscience literature and reports for relatively narrow disciplines or topics on a worldwide basis. Examples include: COAL DATA BASE, PETROLEUM ABSTRACTS, ROCK MECHANICS INFORMATION SERVICE and GEOPHYSICAL ABSTRACTS. The remainder are more specialized or restricted in geographic scope.

As with source databases, more attention is being paid to management aspects of development and operation. As one example, a project was initiated in 1977 to upgrade the GEOSCAN database (then called the Canadian Index to Geoscience Data) following a nine-year history of development and operation.

The main objectives were to acquire a state-of-the-art software package and to convert the existing database to an international standard. The following major steps were or will be taken:

1. Definition of corporate and system objectives (1977)
2. Determination of user needs in Canada (1978)
3. Determination of system requirements (1979-80)
4. Evaluation of available software packages (1980)
5. Development of an implementation plan (1980)
6. Developing and implementing database conversion specifications (1981)
7. Developing specifications for the database management system (1981)
8. Implementing the new system (1981)
9. Post-implementation review (1982).

Although all steps are important, the third one, "Determination of system requirements" is considered the key to development of an optimal solution. In this case the MINISIS package, developed by the International Development Research Centre, Ottawa, was selected to form the foundation of a new, modern system.

## Current Trends

Increasing attention is being paid to coverage - defining and measuring it for individual databases, taking steps to eliminate overlaps and gaps, and working out cooperative agreements among related services. Cooperative programs attempt to improve coverage and data quality and at the same time reduce costs, by avoiding duplication and sharing data of common interest. Good progress at the international level has been achieved in western Europe, led by France and West Germany, and by an agreement between the United States (AGI) and France (CNRS/BRGM). The Canadian (GEOSCAN) and Australian (AESIS) databases are built cooperatively by participating provincial/state, federal and industrial organizations.

As the adoption of standards for reference data (e.g. UNISIST, ISO) increases and flexible data management software and facilities become more widespread, areas of special concern can also be tackled in a cooperative form by the fields concerned, without resorting to the creation of yet another database. Examples of topics of current concern with geoscience input that could be supported by "distributed" databases include energy, occupational health and safety and development regions (e.g. northern Canada).

GEOSCIENCE NUMERIC AND BIBLIOGRAPHIC DATA

## 1. List of Geoscience Databases

### A. GENERAL GEOSCIENCE DATABASES

| | Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|---|
| 1. | AUSTRALIAN EARTH SCIENCES INFORMATION SYSTEM (AESIS) | Australian Mineral Foundation, Inc. | Australia | Ref. | Yes | Geoscience literature and unpublished documents concerning Australia. | 01/117<br>30 |
| 2. | COMPREHENSIVE DISSERTATION INDEX (CDI) | University Microfilms International | USA | Ref. | Yes | Includes doctoral and masters theses in the geosciences. | 01/1802<br>02/231 |
| 3. | GEO-INDEX | Geofond Praha - ODIS | Czechoslovakia | Ref. | ? | Includes geoscience literature from Eastern Europe; current status unknown. | 15 |
| 4. | GEOARCHIVE | Geosystems | UK | Ref. | Yes | Worldwide coverage of all aspects of geoscience and mining. | 01/559<br>02/424 |
| 5. | GEOIX | Bureau of Mineral Resources, Geology and Geophysics | Australia | Ref. | No | BMR and Australian publications and records; includes Stratigraphic Index. | 30 |
| 6. | GEODIAL | Alberta Research Council | Canada | Ref. | Yes | Geoscience literature and unpublished documents concerning Alberta. | 07/199 |
| 7. | GEOLOGICAL REFERENCE FILE (GEOREF) | American Geological Institute | USA | Ref. | Yes | Worldwide coverage of geoscience literature; includes theses. | 01/34<br>02/428 |
| 8. | GEOLOGICAL SCIENCE LITERATURE | Bundesanstalt fur Geowissenschaften und Rohstoffe | West Germany | Ref. | No | German-language geoscience literature. | 01/576<br>05/12 |
| 9. | GEOSCAN | Canada Centre for Geoscience Data | Canada | Ref. | No | Geoscience literature and unpublished documents concerning Canada. | 01/229 |

| Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|
| 10. JICST: EARTH SCIENCE, MINING AND METALLURGY | Japan Information Centre for Science & Technology | Japan | Ref. | Yes | Japanese-language abstracts or world Geoscience literature. | 01/846 02/599 |
| 11. NORTHERN TERRITORY | Northern Territory Dept. Mines and Energy | Australia | Ref. | No | Publications and reports. | 30 |
| 12. NTIS BIBLIOGRAPHIC DATA FILE | National Technical Information Service | USA | Ref. | Yes | Includes government-sponsored reports and publications on geoscience. | 01/1748 02/722 |
| 13. OCEANIC ABSTRACTS | Data Courier, Inc. | USA | Ref. | Yes | Includes literature on marine geology, geophysics and geochemistry. | 01/390 02/778 |
| 14. PASCAL-GEODE | Centre de Documentation Scientifique et Technique | France | Ref. | Yes | Worldwide coverage of geoscience literature. | 01/505 02/883 |
| 15. SADMED | South Australian Dept. Minerals and Energy | Australia | Ref. | No | Publications and reports. | 30 |
| 16. SMITHSONIAN SCIENCE INFORMATION EXCHANGE (SSIE) | Smithsonian Science Information Exchange, Inc. | USA | Ref. | Yes | Includes coverage of geoscience research and development activities. | 01/1304 02/1030 |
| 17. TASMANIA | Tasmanian Department of Mines | Australia | Ref. | No | Publications and reports. | 30 |
| 18. VINITI | All-Union Institute of Scientific and Technical Information | USSR | Ref. | ? | Includes Russian-language coverage of geoscience literature. | 01/1456 |
| B. MINERALS DATABASES | | | | | | |
| 1. ASSESSMENT REPORT INDEX | British Columbia Mineral Resources Branch | Canada | Ref. | No | Unpublished reports submitted by mineral industry. | 16 |
| 2. CANMINDEX | Geological Survey of Canada | Canada | Source | No | Basic information and data on selected mineral deposits in Canada. | 01/231 |

| | Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|---|
| 3. | COMPUTERIZED RESOURCE INFO SPECIALISTS PRGM (CRISP) | US Geological Survey | USA | Source | No | Energy and mineral resource information on selected commodities for certain countries outside US. | 11/37 |
| 4. | DUN'S MARKET IDENTIFIERS (DMI) | Dun & Bradstreet, Inc. | USA | Source | No | Includes marketing data on mining establishments. | 01/446 05/60 |
| 5. | INTERNATIONAL NUCLEAR INFORMATION SYSTEM (INIS) | International Atomic Energy Agency | Austria | Ref. | Yes | Includes geoscience reports and literature related to atomic energy. | 01/787 06/122 |
| 6. | INTERNATIONAL PHOSPHATE RESOURCE DATA BASE (IPROB) | US Geological Survey | USA | Source | No | Data on phosphate occurrences, worldwide. | 11/51 |
| 7. | INTERNATIONAL URANIUM GEOLOGY INFO SYSTEM (INIUREGEO) | International Atomic Energy Agency | Austria | Source | No | Basic data on geology and uranium statistics for various regions. | 17 |
| 8. | IRON RESOURCE ASSESSMENT (FE) | US Geological Survey | USA | Source | No | Petrologic, structural and drilling data from northern Michigan. | 11/52 |
| 9. | MAJOR MINES OF THE WORLD (MON) | US Geological Survey | USA | Source | No | Data from Mining Magazine on mines other than coal. | 11/53 |
| 10. | MANIFILE | University of Manitoba | Canada | Source | No | Mineral deposit data for metallogenic research, worldwide. | 01/1877 11/59 |
| 11. | METALLOGENIC STUDIES (CP MIN MAP) | US Geological Survey | USA | Source | No | Mineral deposit data for plotting on small-scale maps. | 11/55 |
| 12. | MINERAL INDUSTRY LOCATION SUBSYSTEM (MILS) | US Bureau Mines | USA | Source | No | Map location data on non-fuel mineral sites. | 01/1515 |
| 13. | MINERAL OCCURRENCE DATA SYSTEM (MODS) | Newfoundland Mineral Development Division | Canada | Source | No | Mineral deposit data for Newfoundland and Labrador. | 01/1091 |

| Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|
| 14. MINERALS AVAILABILITY SYSTEM (MAS) | US Bureau Mines | USA | Source | No | Data on US and foreign reserves of 34 mineral commodities and on mining aspects. | 01/1515 |
| 15. MINERALS DATA SYSTEM (MDS) | US Geological Survey/ Univ of Oklahoma | USA | Source | Yes | Inludes CRIB database, covering mineral deposits in US and elsewhere, and Geothermal Sample File (GEOS). | 01/1646 11/34 |
| 16. MINFILE (formerly MINDEP) | British Columbia Mineral Resources Branch | Canada | Source | No | Mineral deposit data for British Columbia. | 18 |
| 17. MINING TECHNOLOGY (MINTEC) | Canada Centre for Mineral and Energy Technology (CANMET) | Canada | Ref. | Yes | Literature on mining technology and related topics relevant to Canada. | 04/69 03/232 |
| 18. MINSYS | Mineral Policy Sector | Canada | Ref. | No | Index to National Mineral Inventory (NMI) cardfile. | 19 |
| 19. MINSYS DATORIUM | Geosystems | UK | Source | Yes | Reference and source data on mining, resources and related topics. | 01/559 |
| 20. NICKEL/COBALT (NI/CO) | US Geological Survey | USA | Source | No | Data on magnetic sulphide deposits related to IGCP Project 161. | 11/58 |
| 21. ONTARIO MINERAL DEPOSIT FILE | Ontario Mineral Resources Group | Canada | Source | No | Data on uranium and other metallic deposits in Ontario. | 01/1149 |
| 22. QUEENSLAND | Queensland Geological Survey | Australia | Ref. | No | Company reports. | 30 |
| 23. SURFACE MINING AND ENVIRONMENT INFO SYS (SEAMINFO) | University of Arizona | USA | Ref. | No | Information on strip mining in western US. | 01/1808 |
| 24. TECHNICAL & FIELD SURVEYS | Technical & Field Surveys Pty. Ltd. | Australia | Source | No | Mineral deposit data for Australia. | 30 |

| | Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|---|
| C. | FUELS DATABASES | | | | | | |
| 1. | ALBERTA OIL SANDS INDEX (AOSI) | Alberta Research Council | Canada | Ref. | Yes | Technical information on Alberta oil sands and related topics. | 01/17 02/34 |
| 2. | API MASTER WELL FILE | University of Oklahoma | USA | Source | Yes | Petroleum boreholds in USA. | 31 |
| 3. | CENSUS OF COAL MINES | McGraw-Hill, Inc. | USA | Source | Yes | Information on active coal mines and companies in US and Canada. | 04/26 |
| 4. | COAL DATA | Alberta Research Council | Canada | Source | Yes | Proximate and ultimate analyses of Alberta coals. | 08/23 |
| 5. | COAL DATA BANKS | US Department Energy | USA | Source | Yes | Time series on US coal distribution, production and utilization. | 04/31 |
| 6. | COAL DATA BASE | IEA Coal Research | UK | Ref. | Yes | Coal technology, including reserves, exploration and mining. | 01/1157 |
| 7. | COAL-ABSTRACTS INDEX (COAL-ABS) | Alberta Research Council | Canada | Ref. | Yes | Literature on coal technology related to Alberta. | 08/144 |
| 8. | COALFILE | British Columbia Mineral Resources Branch | Canada | Source | No | Data on B.C. coal deposits. | 20 |
| 9. | DST-80 | McAllister & Associates Ltd. | Canada | Source | No | Drill stem test data for Western Canada petroleum boreholes. | 21 |
| 10. | EASTERN GAS SHALES PROJECT DATA FILE | US Geological Survey | USA | Source | No | Geological, geochemical and physical properties of Devonian shale samples. | 11/42 |

| | Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|---|
| 11. | ENERGY DATA BASE | Engineering Index, Inc. | USA | Ref. | Yes | Includes engineering aspects of mining, petroleum and fuel technology. | 01/464 02/351 |
| 12. | ENERGY DATA BASE (EDB) | US Department Energy | USA | Ref. | Yes | Includes various files on all aspects of energy; data from INIS and COAL DATA BASE. | 01/1583 03/14 |
| 13. | ENERGY RESOURCES DATA SYSTEM (ERDS) | Alberta Energy Resources Conservation Board | Canada | Source | No | Data on Alberta boreholes drilled for oil, gas, coal and oil sands. | 22 |
| 14. | EXPLORATORY WELL FILE | American Assoc. Petroleum Geologists/ Univ. of Oklahoma | USA | Source | Yes | Petroleum exploration boreholes in USA. | 31 |
| 15. | NATIONAL COAL RESOURCES DATA SYSTEM | US Geological Survey | USA | Source | Yes | Includes databases for coal resource estimates for states east (ECOAL) and west (WCOAL) of Mississippi River. | 01/1653 11/48 |
| 16. | OIL INDEX (OLJE-INDEKS) | Norsk Sentre for Informatikk | Norway | Ref. | Yes | Includes literature on petroleum geology and exploration. | 01/1118 02/787 |
| 17. | PENN STATE COAL DATA BASE | Pennsylvania State University | USA | Source | No | Characteristics of coal seams, including geology, mineralogy and mine information. | 01/1177 |
| 18. | PETROLEUM ABSTRACTS (TULSA) | University of Tulsa | USA | Ref. | Yes | Includes petroleum geology, exploration, geochemistry and geophysics; references to other mineral commodities. | 01/1940 02/888 |
| 19. | PETROLEUM DATA SYSTEM (PDS) | University of Oklahoma | USA | Source | Yes | Includes 15 databases on reserves, analyses, production and lease information concerning US and Canada. | 01/1654 04/82 |

| | Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|---|
| 20. | SASKATCHEWAN COAL DATA BASE (SASCO) | Saskatchewan Department Mineral Resources | Canada | Source | No | Borehole and related data used for resource assessment. | 23 |
| 21. | WELL HISTORY CONTROL SYSTEM (WHCS) | Petroleum Information Corp. | USA | Source | No | Petroleum borehole data for US. | 01/1182<br>12/1 |
| 22. | WORLD COAL RESOURCES AND RESERVES DATA BANK | IEA Coal Research | UK | Source | No | Includes geological, geochemical and bibliographic data. | 01/1158 |
| D. | GEOLOGY DATABASES | | | | | | |
| 1. | ASIAN GEOTECHNICAL ENGINEERING (AGE) | Asian Institute of Technology | Thailand | Ref. | No | Technological information related to developing countries in Asia. | 01/71 |
| 2. | BANQUE DES DONNEES DU SOUS-SOL (BSS) | Bureau Recherches Geologiques et Minieres | France | Source | No | Subsurface data on geology, geophysics, hydrology and minerals. | 05/45 |
| 3. | COMPUTERIZED FILE OF GEOLOGIC MAP DATA | US Geological Survey | USA | Ref. | No | Catalogue of availability of geologic map data. | 11/33 |
| 4. | COMPUTERIZED LIBRARY OF ANALYZED IGN PKS (CLAIR) | University of Melbourne | Australia | Source | No | Petrological data on igneous rocks, world-wide. | 01/1880<br>30 |
| 5. | CORE LIBRARY DATA FILE (CLDF) | US Geological Survey | USA | Source | No | Data on drill cores held by USGS Core Library. | 11/38 |
| 6. | EARTH SCIENCES INFORMATION SYSTEM | Netherlands Soil Survey Institute | Netherlands | Source | No | Data on borehole samples from Dutch subsurface and from soil and geological maps. | 01/1072 |
| 7. | EARTHNET SATELLITE IMAGERY (LEDA) | European Space Agency | Italy | Ref. | Yes | Index of LANDSAT imagery. | 02/315<br>05/45 |
| 8. | GENERALIZED SAMPLE DATA SYSTEM (GSDS) | US Geological Survey | USA | Source | No | Data on samples related to oil and gas development; linked to Well History Control System. | 11/26<br>13 |

| | Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|---|
| 9. | GEO ABSTRACTS | Geo Abstracts Ltd. | UK | Ref. | No | Includes literature of sedimentology, remote sensing and cartography. | 01/544 10/141 |
| 10. | GEODAS | Osaka City University | Japan | Source | No | Geological borehole data. | 24 |
| 11. | GEOLOGIC NAMES (GEONAMES) | US Geological Survey | USA | Source | No | Rock-stratigraphic names of the US, in accordance with AAPG standard. | 01/1647 11/44 |
| 12. | IGNEOUS BASE (IGBA) | Carnegie Institution of Washington | USA | Source | No | Petrological data on igneous rocks from world's literature. | 12/27 |
| 13. | IMAGERY DATA BASE FILE | US Geological Survey | USA | Ref. | No | Catalogue and index of remotely-sensed imagery. | 01/1644 |
| 14. | INDEX TO BEDROCK GEOLOGICAL MAPPING | British Columbia Mineral Resources Branch | Canada | Ref. | No | Compilation of geological maps concerning British Columbia. | 25 |
| 15. | INDEX TO GEOLOGIC MAPS (GEOINDEX) | US Geological Survey | USA | Ref. | No | Catalogue and index of geological maps received by USGS Library. | 11/50 |
| 16. | PETROS | Eastern Washington University | USA | Source | No | Petrological data from literature on selected igneous rocks. | 12/27 |
| 17. | RADIOMETRIC AGE DATA BANK (RADB) | US Geological Survey | USA | Source | No | Radiometric ages and supporting data for US and territories. | 01/1643 11/67 |
| 18. | ROCK INFORMATION SYSTEM (RKNFSYS) | Carnegie Institution of Washington | USA | Source | No | Petrologic data for Cenozoic volcanic and associated rocks. | 01/260 12/27 |
| 19. | ROCK MECHANICS INFORMATION SERVICE | Imperial College of Science and Technology | UK | Ref. | No | Literature on rock and soil mechanics and related mining geophysics and geology. | 01/1871 02/991 |

| | Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|---|
| 20. | US OIL AND GAS ROCK CENSUS (ANOGRE FILE) | US Geological Survey | USA | Source | No | Geologic and stratigraphic data on US formations considered to be hold rocks for oil or gas. | 11/85 |
| 21. | WELL CORE LIBRARY (CORE-DATA) | US Geological Survey | USA | Source | No | Basic data on cores stored at USGS Core Library, Denver. | 11/86 |
| E. | GEOCHEMISTRY DATABASES | | | | | | |
| 1. | CHEMICAL ABSTRACTS (CA SEARCH) | American Chemical Society | USA | Ref. | Yes | Includes literature of geochemistry. | 01/30 02/140 |
| 2. | CLAY MINERALOGY ANALYSIS (CLAYMI) | US Geological Survey | USA | Source | No | Analyses of clay samples collected at sea. | 11/32 |
| 3. | ENVIRONMENTAL DATA INDEX (ENDEX) | National Oceanographic Data Center | USA | Ref. | Yes | Includes reference to data sets of geochemical and geological nature. | 01/1738 |
| 4. | GEOCHEMICAL ANALYSIS DATA BASE (GEOCHIM 1) | Institut Francais du Petrole | France | Source | No | Analyses on crudes, gases, rocks and oil-field waters. | 01/521 05/45 |
| 5. | GEOCHEMICAL DATA SYSTEM | Saskatchewan Research Council | Canada | Source | No | Analyses and field data. | 32 |
| 6. | GEOGEN | Centre de Recherches Petrographiques et Geochimiques | France | Source | No | Geochemical analyses and supporting descriptive data. | 27 |
| 7. | GRANITES URANIFERES FRANCAIS (GUF) | Centre de Recherches Petrographiques et Geochimiques | France | Source | No | Analyses of French Hercynian granites. | 27 |
| 8. | LEAD ISOTOPE DATA BANK (LIDB) | US Geological Survey | USA | Source | No | Isotopic data for rocks and ores, worldwide. | 12/32 |
| 9. | MARINE RESOURCE DATA BANK | National Geophysical and Solar-Terrestrial Data Center | USA | Source | No | Analyses of manganese nodules, worldwide. | 12/28 |

| | Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|---|
| 10. | NATIONAL COAL RESOURCES DATA SYSTEM | US Geological Survey | USA | Source | Yes | Includes analysis of coal samples (BMALT); and trace element analysis on coal and related rocks (USCHEM). | 01/1653 11/72 |
| 11. | NATIONAL GEOCHEMICAL DATA BANK (NGDB) | Institute of Geological Sciences | UK | Source | No | Archival storage for public geochemical data produced or analysed in the UK. | 01/1056 |
| 12. | NATIONAL URANIUM RESOURCE EVALUATION PROGRAM (NURE) | US Department Energy | USA | Ref. | No | Geochemistry and geophusics of uranium. | 01/1565 12/28 |
| 13. | ROCK ANALYSIS STORAGE SYSTEM (RASS) | US Geological Survey | USA | Source | No | Analytical geochemical data on rocks and other substances from USGS laboratories. | 01/1645 11/69 |
| 14. | WORLD DATA BANK ON MANGANESE NODULES | Scripps Institution of Oceanography | USA | Source | No | Chemical analyses of manganese nodules, worldwide; includes bibliographic data. | 12/28 |
| F. | GEOPHYSICS DATABASES | | | | | | |
| 1. | BUREAU GRAVIMETRIQUE INTERNATIONAL (BGI) | Bureau de Recherches Geologiques et Minieres | France | Source | No | Gravity data. | 05/45 |
| 2. | EARTHQUAKE DATA FILE | National Geophysical and Solar-Terrestrial Data Center | USA | Source | No | Worldwide earthquake data, including dates, times, depths of focus, etc. | 12/4 |
| 3. | GEOLOGICAL DATA CENTER DATA BASE | Scripps Institution of Oceanography | USA | Source | No | Includes magnetic and seismic data. | 01/1831 |
| 4. | GEOPHYSICAL ABSTRACTS | Geo Abstracts Ltd. | UK | Ref. | No | Literature of geophysics. | 01/544 10/144 |
| 5. | GEOTHERMAL RESOURCES (GEOTHERM) | US Geological Survey | USA | Source | No | Includes files on geochemical analyses, wells, and geothermal fields and areas. | 01/1655 |

| | Name | Organization | Country | Type | Public Online Access | Comments | References* |
|---|---|---|---|---|---|---|---|
| 6. | INSPEC | Institution of Electrical Engineers | UK | Ref. | Yes | Includes files on geochemical analyses, wells, and geothermal fields and areas. | 01/1655 11/45 |
| 7. | MAGNETIC FIELD SURVEY DATA (SOURCE FILE) | Earth Physics Branch | Canada | Source | No | Component observations, primarily from Canada. | 28 |
| 8. | NATIONAL GEOTHERMAL INFORMATION RESOURCE (GRID) | University of California | USA | Ref. | Yes | Literature and reports on geothermal energy. | 01/1817 02/706 |
| 9. | NATIONAL GRAVITY DATA BASE | Earth Physics Branch | Canada | Source | No | Station and gravity anomoly data for Canada. | 29 |
| 10. | SEARCHABLE PHYSICS INFORMATION NOTICES (SPIN) | American Institute of Physics | USA | Ref. | Yes | Includes literature on geophysics. | 01/39 02/1016 |
| 11. | SEISMIC DATA ANALYSIS SYSTEM (SEDAS) | US Geological Survey | USA | Source | No | Data from earthquake monitoring stations, worldwide. | 11/70 |
| 12. | VOLCANO DATA FILE | Smithsonian Institution | USA | Source | No | Location, features and activities related to volcanos, worldwide. | 12/21 |

Compiled by
Canada Centre for Geoscience Data
16 March 1981
Updated 21 April 1981

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* First number is directory or other reference shown in 2. List of Database Directories; second number is entity or page number; up to 2 references only shown.

## 2. List of Database Directories

GENERAL - INTERNATIONAL

1. Encyclopedia of information systems and services. Fourth Edition. A.T. Kruzas and J. Schmittroth, Jr., Editors, Gale Research Co., Detroit, Michigan, USA, ISBN 0-8103-0942-4, 1981, 933p.

2. Computer-readable data bases: a directory and data sourcebook. M.E. Williams et al., Editors, American Society for Information Science, Washington, D.C., USA, ISBN 0-914236-45-8, October 1979, 1,367p.

3. Directory of online information resources. Sixth Edition. A. Levy and J. Kubalak, Editors. CSG Press, Rockville, Maryland, USA, September 1980, 66p.

4. Directory of online databases. Vol. 2, No. 1. R.N. Landau et al., Editors. Cuadra Associates, Inc., Santa Monica, California, USA, Fall 1980, 154p; updated with Vol. 2, no. 2, Winter 1981, 37p.

5. EUSIDIC database guide. A. Tomberg, Editor. Learned Information, Oxford, UK and New York, NY, USA. ISBN 0-904933-13-X, 1978, 130p.

6. Directory of United Nations information systems and services. Inter-Organization Board for Information Systems, Geneva, Switzerland. March 1978, 267p.

7. On-line bibliographic data bases, 1979 directory. J.L. Hall. Aslib, London, ISBN 0-85142-115-6, January 1979, 94p.

GENERAL - NATIONAL

8. COIN: a directory of computerized information in Canada. First Edition. S. West, Editor. Alberta Information Retrieval Association, Edmonton, Alberta, Canada, ISBN 0-920346-03-0, March 1980, 772p. (available for online searching from University of Alberta, Edmonton).

9. Espial data base directory: current Canadian information contained in selected data bases and data banks. H.C. Campbell, Director. Espial Productions, Toronto, Ontario, Canada. ISBN 0-919027-01-6, October 1979, 28p.

10. Inventory of abstracting and indexing services produced in the U.K. G. Burgess et al. The British Library Rept. 5420, London, UK, December 1978, 107p.

GEOSCIENCE

11. Scientific and technical, spatial, and bibliographic data bases of the U.S. Geological Survey, 1979. U.S. Geological Survey Circular 817, Alexandria, Virginia, USA, 1979, unpaged.

12. Directory of U.S. data repositories supporting the international Geodynamics Project. A.H. Shapley, Chairman. World Data Center A for Solid Earth Geophysics, Environmental Data and Information Service, Report SE-14, Boulder, Colorado, USA, August 1978, 40p.

13. Inventory of natural hazards data resources in the federal government. J.F. Lander et al. National Oceanographic and Atmospheric Administration and U.S. Geological Survey, Boulder, Colorado, USA, May 1979, 122p.

14. Guide to NOAA's computerized information retrieval services. National Oceanographic and Atmospheric Administration, Environmental Data and Information Service, Washington, D.C., USA, April 1979, 32p.

OTHER REFERENCES TO DATABASES

15. GEO-INDEx. 1975. Hard-copy publication, and J. Hruska, personal communication.

16. GEOLOGICAL DIVISION. 1979. Assessment report index. British Columbia Mineral Resources Branch, Victoria, B.C.

17. TROCKI, L. and Hansen, M.V. 1979. Description of the International Uranium Geology Information System (INTURGEO). International Atomic Energy Agency, Vienna, Austria (unpublished report).

18. SINCLAIR, A.J., WYNNE-EDWARDS, H.R. and SUTHERLAND-BROWN, A. 1978. An analysis of distribution of mineral occurrences in British Columbia. British Columbia Ministry of Mines and Petroleum Resources, Bull. 68, 125p.

19. JASWAL, I.S. 1979. A review of existing departmental systems for cataloguing and retrieving mineral occurrence data [MINSYS, CANMINDEX, GEOSCAN]. Department of Energy, Mines and Resources, Central Evaluation Group Rept. PE 15/1979, 67p. (unpublished report).

20. KENYON, C. 1981. COALFILE - B.C. Ministry of Energy, Mines and Petroleum Resources. Oral presentation to "British Columbia Computers and Coal Seminar", Victoria, B.C., 26 March 1981.

21. McALLISTER & ASSOC. LTD. 1980. DST-80: a breakthrough in the reliability, accessibility and application of drill stem test data in petroleum exploration. Company brochure, Calgary, Alberta, 16p.

22. MORIN, E.V. Director. 1980. Master scope document [for Energy Resources Data System]. Energy Resources Data System, Calgary, Alberta (unpublished report).

23. IRVINE, J.A., WHITAKER, S.H. and BROUGHTON, P.L. 1978. Coal resources of southern Saskatchewan: a model for evaluation methodology. Geological Survey of Canada Ec Geol Rept 30, Dept. of Mineral Resources Rept. 209, Saskatchewan Research Council Rept. 20, Part 1, 156p.

24. WADATSUMI, K. 1980. Interactive graphic data entry and display for the Geo-Database system (Abstract). CODATA Bulletin 37, p.30.

25. GEOLOGICAL DIVISION. 1980. Index to bedrock geological mapping 1979. British Columbia Ministry of Energy, Mines and Petroleum Resources, Victoria, B.C.

26. ISP NEWSLETTER, 4/3, September 1980, p.2.

27. GRANDCLAUDE, P. 1980. Data collection, banking, processing and display in information systems for earth sciences application to geochemistry. CODATA Bulletin 39, p.34-43.

28. VAN BEEK, G.J. Editor. Catalogue of services of the Division of Geomagnetism. Earth Physics Branch, Ottawa, Canada, 27p. (unpublished report).

29. GRAVITY AND GEODYNAMICS DIVISION. 1980. National gravity data base/Base nationale de données gravimétriques. Earth Physics Branch, Ottawa, Canada, November 1980, 3p., app. (unpublished report).

30. AUSTRALIAN MINERAL FOUNDATION. 1981. Geoscience numeric and bibliographic data. Australian Mineral Foundation, Inc., Seminar 154/81 Proceedings, Adelaide, 30 March - 1 April 1981.

31. UNIVERSITY OF OKLAHOMA. 1980. Descriptive brochures. University of Oklahoma Information Systems Programs, Norman, Oklahoma, 10/1/80.

32. NATIONAL RESEARCH COUNCIL OF CANADA. 1981. Survey of Canadian data bases for science and technology (report in preparation, publication anticipated 1981).

# PUBLIC ON-LINE INFORMATION RETRIEVAL SERVICES

APPENDIX G

## PRELIMARY USE INDICATIORS:

## SAMPLE OF KEY FEDERAL ORGANIZATIONS

Note to Appendix G

While the work plan of the Task Force did not include data collection, the almost total dearth of data on usage statistics on public on-line retrieval services created a gap too wide to ignore. The Lawson study cited in the Report based on the post-secondary education sector indicated a 90% reliance by Canadians on U.S. data base services.

In order to obtain some insight into the possible range of offshore dependence, a short survey was undertaken of a number of key federal government agencies who agreed to participate using readily available data.

The results indicate a 62.5% U.S. dependency based on expenditures for 1980/81. Two things should be noted here, namely:

1. That there may be significant variance in usage patterns on a sectorial basis; and,

2. No data is currently available on usage patterns by non-public institution, i.e. business. This is the fastest growing sector.

Table G.1 On-Line Retrieval Volume and Expenditures of Key Federal Departmental Libraries (1980/81).

| Department Organization | Usage/Volume* No. of Hours | No. of Searches |
|---|---|---|
| National Library | | 1,913 |
| CISTI - Automated Systems | 2,994 | |
| - Health Sciences Resource Centre | 549 | |
| Agriculture | 537 | 2,800 |
| Communications | | 286 |
| Envirenment Canada | 160 | |
| Health and Welfare | 286 | |
| Library of Parliament | | 2,012 |
| Statistics Canada | 53 | |
| | 4,615 | 4,031 |

Total Expenditures $225,056

*Some reported usage in number of hours, others by number of searchers.

Table G.2 Usage of Leading Data Base Venders by Key Federal Libraries (1980/81)*

| U.S. Data Base Vendors | Total Expenditure | Share of Total |
|---|---|---|
| DIALOG | 91,545 | (40.68%) |
| SDC/Infomart | 19,079 | ( 8.48%) |
| BRS | 944 | ( 0.42%) |
| NYT | 3,637 | ( 1.62%) |
| NLM/Medlars (via CISTI) | 25,401 | (11.29%) |
| Total | $140,606 | 62.5% |
| **Canadian Data Base Vendors** | | |
| CAN/OLE | 56,568 | (25.14%) |
| QL | 11,533 | ( 5.12%) |
| Informatech | 1,528 | ( 0.68%) |
| Infoglobe | 9,869 | ( 4.39%) |
| Total | $79,499 | 35.3% |

* Based on those noted in Table G.1

Table G.3: Usage of Database Vendors by Key Federal Departmental Libraries (1980/81)
(all expenditures in Cdn. $)

| Organization/ Group | U.S. DATABASE VENDORS | | | | | | | | CISTI/NLM | | CANADIAN DATABASE VENDORS | | | | | | | | Total Expenditures ($) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Dialog | | SDC/Infomart | | BRS | | NYT | | MEDLARS | | CAN/OLE | | QL | | INFORMATION | | INFOGLOBE | | |
| | Hrs./ Search* | Expend. ($) | Hrs./ Search* | Expend. ($) | Hrs./ Search* | Expend. ($) | Hrs./ Search* | Expend. ($) | Hrs./ Search* | Expend. ($) | Hrs./ Search* | Expend. ($) | Hrs./ Search* | Expend. ($) | Hrs./ Search* | Expend. ($) | Hrs./ Search* | Expend. ($) | |
| National Library (CBRS) | 1,200* | 14,500 (54.7%) | 135* | 4,000 (15.1%) | 95* | – | 47* | 2,500 (9.4%) | | | 240* | 2,000 (7.6%) | 63* | 1,000 (3.8%) | 61* | 1,000 (3.8%) | 36* | 1,000 (3.8%) | 26,500 |
| °CISTI/Ref. & | 195 | 31,177 | 50 | 7,967 | | | | | | | 427 | 34,402 | | 2,486 | | 248 | | | 76,281 |
| °CISTI/ISRC | | | | | | | | | 526 | 19,860 (95.1%) | 23 | 1,024 (4.9%) | | | | | | | 20,884 |
| Agriculture (Info. Services) | 386 | 22,425 (62.3%) | | | | | | | | | 147 | 10,830 (30.1%) | | | | | | | 36,025 |
| Communications (Ref. Services) | | | – | 1,262 (38.0%) | | | | | | | – | 2,062 (62.0%) | | | | | | | 3,323 |
| Environment Canada | 42 | 3,235 (29.4%) | | | | | | | | | 85 | 5,501 (50.1%) | 33 | 2,248 (20.5%) | | | | | 10,984 |
| Health & Welfare | 107 | 9,420 (50.4%) | 20.6 | 2,134 (11.4%) | 10.3 | 944 (5.1%) | 0.4 | 54 | 122 | 5,541 (29.7%) | 3.6 | 164 | 1.8 | 159 | | | 2.4 | 269 | 18,684 |
| Library of Parliament(CBRS) | 512* | 7,152 (27.6%) | 227* | 2,347 (9.06%) | | | 48* | 1,083 (4.18%) | | | 59* | 259 (1.0%) | 624* | 5,416 (20.9%) | | | 479* | 8,101 (31.3%) | 25,912 |
| Statistics Canada | 30 | 3,636 (56.3%) | 9.3 | 1,369 (21.2%) | | | | | | | 7.8 | 326 (5.0%) | – | 224 (3.5%) | 4 | 280 (4.3%) | 2.1 | 499 (7.7%) | 6,463 |
| Total Expend. | | 91,545 | | 19,079 | | 944 | | 3,637 | | 25,401 | | 56,568 | | 11,533 | | 1,528 | | 9,869 | 225,056 |
| % of Total Expend. | | (40.68) | | (8.48) | | (0.42) | | (1.62) | | (11.29) | | (25.14) | | (5.12) | | (0.68) | | (4.39) | (100.00) |

Note: 1. The 5 top U.S. Vendors (including NLM/MEDLARS) account for 62.5% of the total expenditures.
2. The 4 top Canadian Vendors account for 35.3% of the total expenditures.

APPENDIX H

# LIST OF ORGANIZATIONS CONTACTED

During the course of this study, contacts were made with many of the main Canadian producers and vendors of online databases, to obtain information regarding usage volumes, costs and trends. Table H.1 contains a list of government agencies and private firms who were approached. Representatives from CISTI, the National Library and the Public Archives of Canada participated in the work of the project team.

Contacts with producers and vendors gave some preliminary information on the supply side of the Canadian public information services industry, but the gap on the demand side remained. As stated earlier, the time constraints imposed by the Task Force's short term work program, as well as resource constraints, ruled out the possibility of a proper survey of end users at this stage. As a preliminary measure, the chief librarians of certain key federal departments and organizations were contacted, in an attempt to collect some rudimentary yet basic statistics regarding the use of reference and source textual databases. The list of these organizations contacted is given in Table H.2. Appendix G summarizes their basic usage statistics for Fiscal Year 1980/81.

Interviews with the MNEs will include questions on their internal use of online databases, both for transaction processing and information retrieval. The magnitude of such intra-corporate use may far exceed current open market use of public information services, but very little is known of such use.

The quantitative assessments and projections of the Canadian market made in the draft final report were informally exposed to the principal Canadian vendors for comments, in order to ascertain whether they are regarded as realistic.

Table H.1: List of Canadian Online Database Producers and Vendors contacted

| Type of Institution | Name of Organization | Function | Description of Activities |
|---|---|---|---|
| Government Agency | Statistics Canada -CANSIM -Telidon Task Force | Producer | Produces, maintains and distributes CANSIM, the largest socio-economic database in Canada. |
| | CISTI, National Research Council | Vendor | Largest Canadian vendor of reference databases; CAN/OLE and CAN/SDI services. |
| | National Library | User | One of the largest users of computer-based reference services. |
| Private Firm | Datacrown Ltd. | Vendor | Previously host service bureau for the CANSIM Main Base (Time Series and Cross-classified Modules). |
| | I.P. Sharp Associates | Vendor | Largest Canadian vendor of public source numeric databases, operates internationally. |
| | QL Systems Limited | Vendor | QL/Search system provides access to both reference and source (full text) databases. |
| | Infomart | Producer and Vendor | Prime promoter and international marketing agent for Telidon technology; major information provider to Telidon; distributor in Canada of the SDC/Orbit search service. |
| | Info Globe Ltd. | Producer and Vendor | Operates the Globe and Mail information retrieval service. |
| | Informatech | Vendor | Major vendor for French language databases. |
| | Micromedia Limited | Vendor | Provides technical suport and training for Dialog users in Canada |

Table H.2: List of Key Federal Government Librarians invited to the Public Information Services meeting on 16.12.81

| Department/ Organization | Group/Function |
|---|---|
| National Library | Chief, Computer Based Reference Service |
| CISTI, National Research Council | °Coordinator, Automated Systems<br>°Librarian, Health Sciences Resource Centre |
| Agriculture Canada | Assistant Director, Information Services |
| Canada Employment and Immigration | SDI Librarian |
| Communications | Head, Reference Services |
| Environment Canada | SDI Librarian |
| Finance and Treasury Board | Chief Librarian |
| Health and Welfare | Chief Librarian |
| I.D.R.C. | Deputy Librarian |
| Library of Parliament | Head, Computer Based Reference Service |
| Statistics Canada | Chief Librarian |

# REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

# VOLUME III

## Appendix I

# REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

## VOLUME III

## Appendix I

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

VOLUME III

APPENDIX I

# COMPENDIUM OF ON-LINE DATA BASES CURRENTLY BEING ACCESSED BY CANADIANS

## Notes to Appendix I

### A. GENERAL

Other appendices in the Report on On-Line Information Retrieval Services provided data on offerings of selected Canadian and U.S. data base vendors as well as data base offerings in selected thematic areas. The purpose of this appendix is to provide a compendium of on-line data bases which are currently being accessed by Canadians. Canadian on-line data bases form a sub-set of the Compendium.

There have been a number of activities of an on-going or one-time nature in this area. The goal of a data base of data bases is currently being pursued simultaneously by private, non-profit and government organizations. Work by Quadra Associates, Martha Williams, Kruzas and Schmittroth in the U.S., the EUSIDIC Data Base guide for Europe and the COIN Directory for Canada have already been mentioned in Section B.3 of the Report.

In the Canadian context and for purposes of the Task Force, the COIN Directory is the most comprehensive Canadian directory of data bases currently available. In addition, the Advisory Board on Scientific and Technical Information (ABSTI) of the National Research Council of Canada commissioned Acton Information Resources Management Ltd. to undertake "A Survey of Canadian Data Bases for Science and Technology". And the Department of Communications commisioned Professor D. Seeley (Computer Science, Simon Fraser University) to carry out a study on data banks in Canada. These three studies, especially the COIN Directory, form the basis for the "Compendium of On-Line Data bases Currently Being Accessed by Canadians".

Of specific interest to the work of the Task Force are answers to the following basic questions:

1. What Canadian on-line data bases do currently exist?
2. Of the on-line data bases available to Canadians which do they currently make use of?
3. What are the sources of these data bases and who are the vendors? For which data bases are there more than one vendor?
4. What roles do the data base provider, producer, distributor, etc. play? What is the focus of the data base, i.e. target market?
5. What is the main content of the data base?
6. When did the data base activity start?
7. What is the size of the data base?

8. What is the demand/usage of the data base? i.e. volume of searches, connect hours, etc.

9. What is the charging algorithm for usage and what are the revenues?

It proved not feasible (and possible) at this point in time to obtain answers to questions 8 and 9. Even though answers are vital to our understanding not only of the demand side of this industry but also of possible trends and switching in preferences by users for on-line information services. The present structure of the Compendium reflects these constraints. Suggestions as to how it could be improved in mode of presentation or contents are welcomed.

One important caveat which must be made with respect to the Compendium is that it suffers from two basic weaknesses. The first is due to the rapid growth of on-line data base activity, averaging a 30% increase annually over the past few years. Consequently, the Compendium and similar compilations will be out-of-date. An on-line data base of data bases would alleviate most of this problem.

The second weakness of the Compendium is related to the traditional focus of the directories on which it is based. That focus is one of reference and source data bases known by and used in the library world. Consequently, on-line information data base services which carry a high-price and/or are business-oriented may not be used or known in libraries which cannot afford to offer such data bases. Few libraries run on a cost-recovery basis, the others are either heavily subsidizing on-line services or absorbing the access costs completely. Yet the business sector's interest in specialized high value data base services offers the best growth opportunity both in terms of product differentiation and potential market penetration.

Consequently, any future work of a Compendium-like nature will find its utility greatly increased if it can overcome these two weaknesses.

## B. SPECIFIC

### 1. Sources

#### a. COIN Directory

A description of the COIN Directory has already been provided in B.3 of the main body of the report. The COIN Directory is the currently most comprehensive source available of on-line data

bases available in Canada. It lists for each data base, the current Canadian clients of the data bases. Although the vast majority of these are libraries or documentation centres there is a sprinkling of companies or individuals noted.

As the sub-title "A Directory of Computerized Information in Canada", indicates, the COIN Directory includes in its listing a number of data files. This is especially true in the area of source data bases where there are a significant number of listings which are data files processed in a batch mode (on demand). In the Compendium, this has been noted.

b. Survey of Canadian Data Bases for Science and Technology

This study undertaken for ABSTI in 1980 is still in "draft form". However, it was made available to the authors in order to ensure as complete a Compendium as possible. The ABSTI Survey focused on identifying "significant Canadian scientific and technical data bases" and identified a total of 173. However, the survey also includes data files as well as surveys, catalogues and other types of machine-readable data which are not "public on-line data bases" as defined in the context of TBDF.

c. Seely Study on Data Banks in Canada

The Department of Communications contracted in 1981 with Professor D. Seeley (Computing Science, Simon Fraser University) to undertake a research study on data banks in Canada; their type, ownership, control and access: Part of the work included the preparation of a "selective"directory of data bases which:

- "are compiled, stored and accessible within Canada;
- are available on-line or in computer readable form;
- are available to the public or easily accessible through membership or subscription;
- contain Canadian material;
- are non-bibliographic i.e. must contain answers, facts and data rather than pointers, references to other sources, e.g. bibliographic; and,
- are current to January 1981".

The directory thus also contains listing of data files as distinct from on-line data bases.

2. Notes on the Compendium

The following topology was used to prepare the Compendium.

Name -
of the data base
(There are instances where in the same basic area the manner in which the information has been packaged is different enough to warrant listing as a spearate data base, e.g. Back 72, Back 75.)

Reference -
source of the information
1 COIN Directory
2 Seeley Directory
3 ABSTI Directory
4 Other Sources

(Where more than one source provided informtaion on the data base this has been noted.)

Functions -
1 provider/creater
2 producer
3 vendor
4 broker

(Any combination can apply. As work on the Compendium developed it became apparent that the usefulness of this column in its present context is open to question. It may therefore be dropped in the final version.)

Description of Key Activities -
maximum of 150 characters describing briefly the content/coverage of the data base

Source -
name of the information provider/supplier/creator

Language -
command language in which data base can be accessed

Principal Focus -
indication of the principal focus of the content of the data base

1 science and technical
2 business and finance
3 social science and humanities

4 professional support, i.e. medical, legal
5 consumer (mass market including news)

(These categories are not mutually exclusive and more than one may apply.)

Starting Date -
date given as when the data base activity was started or how far its content goes back in time

Size of Data Base -
in terms of records, entries, characters (bytes, Megabytes), etc.

Volume/Activity -
in terms of search requests, hours of access, etc.

(It was not possible to obtain this data during the time available since the directory used do not provide this.)

Cost Revenues -
only information on costs or access charges was readily available $45* or $8* indicates usage is charged in U.S. dollars on the Cost/Revenue Column

3. Notes on the Cost/Revenue Column

a. Data bases where the vendor is the University of Alberta are accessed via an account number which has to be established with the university's Computer Services.

Although the charges are based on an algorithm common to computer service bureaus (including CPU's), from the user's point of view, the cost of accessing these data bases should average out to $1.50 - $2.00 per search using SPIRES. Communication is available via Datapac. Further, the university's Computer Services advised that in most cases it would be less expensive to simply have the records or citations printed-off on-line unless the file to be printed is very large.

No royalties are paid to providers of data bases mounted by this vendor.

b. Access to data bases being offered by the International Development Research Centre (IDRC) are currently available free of charge on an experimental basis to government, academic and non-profit institutions.

c. The Badaduq system of the University of Quebec is actually one integrated data base system and the COIN Directory is somewhat misleading in listing various components or subject areas as separate data bases. Badaduq services the campus network of the University of Quebec and is available free of charge throughout the network. Badaduq has made arrangements with a number of outside users (mainly libraries and documentation centres) allowing access to Badaduq free of charge for those who do research. One of the design goals of the Badaduq system is ease of use and consequently the remote terminals at Badaduq nodes are meant to be useable by students and researchers with very little handholding.

4. Arrangement of Compendium

Insofar possible, the Compendium has been arranged in alphabetical order acording to the name of the data base. It has further been split into two sections. The first being a listing of reference data bases, the second part being a listing of source data bases.

The name of the data base has been repeated for each unique combination of source and vendor since the vendors have different prices for the same data base. Further, as mentioned above, if certain parts of a data base have been packaged separately e.g. Back 72, Back 77 for Medline citations, they are listed separately. A listing of data bases with multiple vendors is presented below.

LISTING OF DATA BASES IN CANADA BEING SOLD

THROUGH MULTIPLE VENDORS

| Name of Data Base | Vendors |
|---|---|
| ABI/INFORM | Infomart, BRS, Dialog |
| Agricola | Infomart, BRS, Dialog |
| BIOSIS | Infomart, BRS, Dialog |
| Canadian Business Index | Infomart, QL |
| Canadian Newspaper Index | Infomart, QL |
| Chemistry Industry Notes | Infomart, Dialog |

## LISTING OF DATA BASES IN CANADA BEING SOLD THROUGH MULTIPLE VENDORS (Cont'd)

| Name of Data Base | Vendors |
|---|---|
| Congressional Information Services | Infomart, Dialog |
| Conference Papers Index | Infomart, Dialog |
| Congressional Record | Infomart, Dialog |
| Dissertation Abstracts | Infomart, BRS |
| ERIC | Infomart, BRS, Dialog |
| Energyline | Infomart, Dialog |
| Engineering Index COMPENDIX | Infomart, Dialog |
| ENVIROLINE | Infomart, dialog |
| ELER | BRS, DIalog |
| FSTA | Infomart, Dialog |
| PO Monthly | BRS, Dialog |
| Grant | Infomart, Dialog |
| ISMEC | Infomart, Dialog |
| INSPEC | Infomart, BRS, Dialog |
| Management Contents | Infomart, Dialog |
| Metal Abstracts | QL, Dialog |
| NTIS | CISTI, Infomart, BRS, Dialog |
| Oceanic Abstracts | Infomart, Dialog |
| PNI | BRS, Dialog |

LISTING OF DATA BASES IN CANADA BEING SOLD

THROUGH MULTIPLE VENDORS (Cont'd)

| Name of Data Base | Vendors |
|---|---|
| Pollution Abstracts | Infomart, BRS, Dialog |
| Psychological Abstracts | Infomart, BRS, Dialog |
| SMIE/SSIE | Infomart, BRS, Dialog |
| World Aluminium Abstracts | QL, Dialog |
| CANSIM | (See Appendix) |

C. ACKNOWLEDGMENT

The authors of this report wish to acknowledge the contribution of Ms. Laura O'Neil (Data and Documentation Analysis, Informan Inc.) for her valuable assistance in putting this Compendium together.

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ABI/INFORM | 1 | 1,2,3 | 1 | Abstracted business information taken from periodicals. | Data Courier, Louisville K.Y. | BRS, New York, N.Y. | E | 2 | Aug. 197 | 105625 records monthly update of 1260 reords | | $55.60*/hr. + $5.50*/hr. telecom. $.10*/citation offline |
| ABI/INFORM | 1 | 1,2,3 | 1 | " " | " | Infomart, Toronto | E | 2 | Aug.1971 | " | | $75*/hr. + $8*/hr. telecom. $.30*/ record offline SDI-$5*/update |
| ABI/INFORM | 1 | 1,2,3 | 1 | " " | " | DIALOG Lockheed | E | 2 | Aug.1971 | " | | $75*/hr. + $5* or $8*/hr. telecom.$.15*/ record offline |
| AIM/ARM | 1 | 1,2,3 | 1 | Abstracted instructional and research materials. | Center for Vocational Education, Ohio State U. | DIALOG Lockheed | E | 4 | Sept.1967 to Sept. 1976 | 17,500 records New Records added to ERIC | | $10* to $25*/ hr. plus $5* or $8*/hr. telecom. $.10/ record offline |
| Accountants Index | 1 | 1,2,3 | 1 | Indexes of periodicals, publications, speeches etc in an accounting, auditing investment security field. | American Inst. of Certified Public Accountant N.Y. | INFOMART, Toronto | E | 2,4 | Jan.1974 | 67,029 records | | $95*/hr. + $5* to $10*/hr. telecom.$.15*/ record offline |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AGI - The Alberta Gazette Index, (Part 1) | 1 | 1,2,3 | 1 | Legal announcements of the Gov't. of Alberta. | Gov't. of Alberta | Univ. of Alberta, Edmonton | E | 4 | 1979-1979 | 31,145 records as of Nov. 1980 Bi-monthly Update | | Univ. of Alberta Computing Centre Charges |
| AGRICOLA (formerly known as CAIN) | 1 | 1,2,3 | 1 | Citations to materials (articles, reports, serials etc.) acquired by the National Agriculture Library and from FAO of the United Nations | National Agriculture Library, Beltsville, Md. | BRS, N.Y. | E | 1 | 1970-1974 offline; 1975 to present online | 1,204,259 records Monthly Update | | $17.10*/ connect hr. + $5.50*/hr. telecom. |
| AGRICOLA | 1 | 1,2,3 | 1 | " | " | DIALOG Lockheed | E | 1 | Jan. 1970 | Not given monthly updates of 10,000 records | | $25*/hr. + 5* or $8*/hr. telecom.$.05*/ record online |
| AGRICOLA | 1 | 1,2,3 | 1 | " " plus FNC (Food and Nutrition Collection) and AgEcon (Agriculture Economics Collection) | " | Infomart, Toronto | E | 1 | Jan. 1970 | 1,204,259 records Monthly Update of 12,000 records | | $35*/hr. + $8*/hr. telecom. $.06/ record offline SDI-$2.50 per update |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AGRIDOC | 3 | 1,2,3 | 1 | Documentation of industries utilizing agricultural products. | Centre de documentation des industries de produits agricoles. | Informatech Montreal | F | 1,2 | 1978 (1974) | 35,000 records | | $40/hr. for Quebec and $70/hr. outside Quebec |
| APTIC | 1 | 1,2,3 | 1 | Technical information on airpollution - its effects, control, prevention. | U.S. Environment Protection Agency, N.C. | DIALOG Lockheed | E | 1 | 1966-1978 | 89000 records as of Jan. 1981 | | $20*-$35*/hr.+ $5* or $8*/hr. telecom. $.10*/record offline |
| AOSI (Alberta Oil Sands Index) | 1 | 1,2,3 | 1 | Bibliographic compilation of keyworded references to technical literature about oil sands deposits appropriate to Alberta. | Alberta Research Council, Edmonton | CISTI | E | 1 | 1970 | 6,200 records Quarterly -250 records | | $45/connect hr. (includes comm. from nearest DATAPAC mode to Ottawa + $.35/citation offline Online ordering - $2.20 minimum. |
| AOSI | 1,3 | 1,2,3 | 1 | " " | " | Univ. of Alberta, Edmonton | E | 1 | 1970 | 6,200 records update bi-weekly | | Univ. of Alberta Computing Centre Charges |

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| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alberta Social Resources Inventory | 1 | 1,2,3 | 1 | Computerized inventory of 'helping' resources available to Albertans. | (contact ALTA/ASRI) | Not given | E | 3 | 1976 | 3,600 records as of Oct. 1980 update twice yearly | | Basic Retrieval plus charge per reference. |
| ALI (Alberta Legislative Information) | 1 | 1,2,3 | 1 | Indexes legislation currently available from Alberta Public Affairs Bureau. | Alberta Public Affairs Bureau, Edmonton | Univ. of Alberta | E | 4 | | 897 records as of Oct. 1980 update weekly | | Univ. of Alberta Computing Centre Charges |
| ALTAENVIRON | 3 | 1,2,3 | 1 | Inventory of research projects related to air, land, water and human environmental subjects in Alberta. | Alberta Environment Centre | Alberta Environment Centre | E | 1 | 1977 (1975) | 3,000 records (update batch twice a year annual growth 250) | | None. |
| ALTAENVIRON | 3 | 1,2,3 | 1 | " " | " | Canadian Plains Research Centre Regina (maintenance) | E | 1 | | " | | Plains Centre current charges |

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| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACWS (All-Canada Weekly Summaries) | 1,2 | 1,2,3 | 1 | Concise summaries of all judgements of all civil cases received weekly by Canada Law Book Ltd. | Canada Law Book Ltd., Agincourt, Ontario | QL Systems Ltd., Ottawa | E,F | 4 | Jan. 1977 to Nov. 1980 | 18,976 decicions Feb.6, 1981 update monthly | | $2.00/sign-on, $2.00/search, $2.00/1000 lines printed offline. Surcharge -/$3 per search |
| ALPFILE (Administration Laboratory Project) | 1 | 1,2,3 | 1 | Non-print materials for the teaching of Educational Administrative students. | Univ. of Alberta, Edmondon | Univ. of Alberta | E | 4 | | 3,000 records as of Jan. 1978 update quarterly | | About $10 per search Univ. of Alberta Computing Centre Charges |
| ALTAENVIRON | 1 | 1,2, 3,4 | 1 | Inventory of research project related to air, land, water and human environmental subjects in Alberta. | Alberta Environment Centre, Cdn Plains Research Centre | Cdn Plains Research Centre, Univ. of Sask, Regina | E | (1),3 | 1975 | 3,000 records as of June 1980 | | |
| AHL (America: History and Life) | 1 | 1,2,3 | 1 | Periodical literature since 1955 on Am. and Can. history and area studies, including current affairs. | ABC-CLIO Inc. | DIALOG Lockheed | E | 3 | 1964 | 91,400 records as of Jan. 1981 update 3 times/yr. | | $50* to $65*/hr. + $5* or $8*/hr. telecom. $.15/record offline |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Agricultural | 3 | 1,2,3 | 1 | All references with an apiculture or bee research (including wild bee). | International Bee Research Association England | Department of Biology, Univ. of Guelph | E | 1 | | 25,000 records update 4 times per year, annual growth rate, 1,200 records | | |
| APILIT | 1 | 1,2,3 | 1 | Citations from 150 journals in areas such as petroleum refining and petrochemicals, air and water conservation, transportation and petroleum substitutes. | American Petroleum Institute, N.Y. | INFOMART, Toronto | E | 1 | Jan. 1964 | 270,737 records as of Jan. 1980 Monthly updates of 1,500 records | | $65* + $8*/hr. telecom. $11/ record offline Non-subscribers: $85* + $8*/hr. telecom. $.20 per record offline |
| APIPAT | 1 | 1,2,3 | 1 | Citations to refining patents, U.S. and foreign, in the same subject areas covered by APILIT. | American Petroleum Institute, N.Y. | INFOMART, Toronto | E | 1 | Jan. 1964 | 115,435 records monthly updates of 700 records | | $65*/hr. + $8*/hr. telecom. Non-subscribers: $85*/hr.+ $8*/hr. telecom. Offline prints: $.11*/ record |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Aquaculture | 1 | 1,2,3 | 1 | Citations from books, periodicals, etc., on the growing of marine, brackish and freshwater organisms. | Lockheed | DIALOG Lockheed | E | 1 | 1970 | 4,300 records as of Jan./81 irregular updates of 300 records | | $20* $35*/hr. + $5* or $8*/hr. telecom. $.10/full record typed or $.15/full record printed offline. |
| AQUALINE | 1 | 1,2,3 | 1 | Access to info. on water, waste water and the aquatic environment worldwide. | Water Research Centre, Buckingham-ahire, England | DIALOG Lockheed | E | 1 | 1974 | 21,000 records as of Dec. 1980 updating monthly | | $20*-$25*/hr.+ $5* or $8*/hr. telecom. $.30/full record printed off-line + $.25/full record typed online. |
| ASFA (Aquatic Sciences and Fisheries Abstracts) | 1 | 1,2,3 | 1 | Comprehensive info. on life sciences of the seas and inland waters as well as related legal, political and social topics. | National Oceanic and Atmospheric Admin.; Rockville, Md. | DIALOG Lockheed | E | 1,3,4 | 1978 | 35,800 records update monthly 1,800 - 2,600 records | | $32*-$47*/hr.+ $5 or $8/hr. telecom. $.20/full record printed offline |
| ASFA | 1,3 | 1,2,3 | 1 | " " | FAO and U.N. Dept't of Economic and Social Affairs | QL Systems, Ottawa | E,F | 1,3,4 | Jan. 1978 to Sept. 1980 | 65,564 records as of Nov.18/1980 monthly | | $2/signon, $2/search and $2/1000 words printed off-line |

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| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ART MODERN | 1 | 1,2,3 | 1 | References to all modern art and design literature in books, + 300 periodicals, dissertations and catalogs from 1974. | ABC-CLIO Inc., Santa Barbara, California | DIALOG Lockheed | E | 3 | 1974 | 29,000 records as of Oct. 1979 update semi-annually | | $45-$60/hr. + $5 or $8/hr. telecom. $.15/record printed off-line. |
| Artificial Intelligence Bibliographic Retrieval Systems | 1,3 | 1,2,3 | 1 | Bibliographic references in artificial intelligence and related fields from journals, books and reports. | Dept. of Computer Science, U.B.C., Vancouver | Dept. of Computer Science, U.B.C., Vancouver | E | 1 | 1950 | 1,500 records as of Dec. 1980 | | Computer charges of U.B.C. computing centre. |
| ASI (American Statistics Index) | 1 | 1,2,3 | 1 | Index of statistical publications from 400 agencies of the U.S. government. | Congressional Information Service, Wash., D.C. | INFOMART, Toronto | E | 2,3 | Jan. 1973 | 861,140 records monthly updates of 800 records | | $100*/hr. + $8*/hr. telecom. $.25/record offline. |
| ASI | 1 | 1,2,3 | 1 | Index of statistical publications from 400 agencies of the U.S. government. | Congressional Information Service, Wash., D.C. | DIALOG Lockheed | E | 2,3 | Jan. 1973 | 861,140 records as of Jan. 1981 updated monthly | | $75-90*hr. $5* or $8/hr. telecom. $.15/record off-line. |
| ASTIS (Arctic Science and Technology Info. System) | 1,3 | 1,2,3 | 1 | Abstracted bibliographic citations providing access to information on the Arctic. | Arctic Institute of North America | Univ. of Alberta, Edmonton | E | 1,3 | Jan. 1978 | 5,048 records as of Oct. 1980 update monthly | | no charge at present |

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| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ASTIS | 1,3 | 1,2,3 | 1 | " " | " | QL Systems, Ottawa | E,F | 1,3 | Jan. 1978 | 4,684 records as of Nov. 1980 | | $2/signon, $2/search, $2/1000 lines printed off-line. |
| APR Atlantic Province Reports | 1 | 1,2,3 | 1 | Selected decisions of the courts of the Atlantic Provinces, as well as Supreme Court of Canada decisions on appeal from those courts. | Canadian Law Info. Council and the Maritime Law Book Council | QL Systems, Ottawa | E | 4 | 1969 to 1978 | 5,129 records as of Nov. 1980 | | $2/signon, $2/search, $2/1000 lines printed off-line. |
| AVLINE | 1 | 1,2,3 | 1 | | U.S. National Library of Medicine | CISTI | E,F | 4 | 1900 | 9,480 records as of Dec. 1980 updating monthly | | $15*/hr. or $8*/hr. (depending on hrs. used) $15*/page of offline + $4*/hr. telecom. |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BA & BA79 Biological Abstracts | 1 | 1,2,3 | 1 | References on all aspects of the life sciences; over 8000 journals monitored. | Biosciences Info. Service of Biological Abstracts; Philadelphia | CISTI NRC, Ottawa | E,F | 1,4 | 1972 | 1,712,240 records from 1972-1978 and 516,596 from Jan. 1979 to Sept. 18, 1980 Monthly updates of 24,000 records | | $40*/connect hr.+ royalties of $20*/connect hr. $.35* per offline citation. |
| Back 72 | 1 | 1,2,3 | 1 | Backfile containing Medline citations from 1972-1973. | U.S. National Library of Medicine | CISTINational Lib. of Medicine, through Cda Institute for Scientific and Technical Information; Ottawa. | E,F | 1,4 | Jan. 1972 to Dec. 1974 | 669,106 records as of Dec. 1980 | | $15*/hr.+ |
| Back 75 | 1 | 1,2,3 | 1 | All references published before 1977 that were previously in Medline. | National Library of Medicine | Same as for Back 72 page 8 | E,F | 1,4 | Jan. 1975 to Dec. 1976 | 642,954 records as of Oct. 1979 | | $15*/hr.or$8*/hr. (depending on time used); $.15/page of offline print+ $5-$10/hr. telecom. |

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| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Back 77 | 1 | 1,2,3 | 1 | Medline citations from 1977 - 1978. Dates are Index Medicus dates. | U.S. National Library of Medicine | Same as above. | E | 1,4 | 1976 to 1977 | 511,005 records as of Dec. 1980 | | $15* or $8*/ hr. (depending on time used); $15*/page off-line + $4*/hr. telecom. |
| Back 66 | 1 | 1,2,3 | 1 | Medline citations from 1966 through 1968. (Dates are Index Medicus dates). | " | " | E,F | 1,4 | Jan. 1966 to Dec. 1968 | 501,801 records as of Dec. 1980 | | " " |
| Back 69 | 1 | 1,2,3 | 1 | Medline citations from 1969 - 1971. (Dates are Index Medicus dates). | " | " | E,F | 1,4 | Jan. 1969 to Dec. 1971 | 668,257 records as of Dec. 1980 | | " " |
| Badaduq-ENAP | 1,3 | 1,2,3 | 1 | Bibliographic references dealing with public administration, political science, economics and management. | Centre de documentation de l'École nationale d'administration publique, St. Foy, Québec | Same as source. | F | 3 | 1960 | 17,000 records as of Dec. 80 Weekly updating Annual growth 1,500 records | | |
| Badaduq - I.N.R.S. - Education | 1 | 1,2,3 | 1 | French language bibliographic citations to references in the field of education, psychology and sociology. | Service de documentation de l'I.N.R.S. Education | Same as source. | F | 3,4 | 1950 | 3,000 records 500 records added annually | | |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Badaduq - I.N.R.S. - Urbanisation | 1 | 1,2,3 | 1 | French language references on the subject of urbanization. | Centre de documentation de l'I.N.R.S. | Same as source. | F | 3 | 1970 | 5,000 records as of Dec. 1980 annual update | | |
| Badaduq - Insectes | 1 | 1,2,3 | 1 | French language references to articles on all aspects of insects. | Groupe de recherche sur les insectes piqueres; Trois-Rivières, Québec | Same as source. | F | 1 | 1940 | 6,000 records 2,000 records added annually | | |
| Badaduq- Banque de recherches biologiques de l'Institut Armand-Frappier | 1,3 | 1,2,3 | 1 | French language reference on the subjects of biology, veterinary medicine and virology. | Institut Armand-Frappier, Laval-des-Rapides, Québec | Institut Armand-Frappier, Laval-des-Rapides, Québec | F | 1 | 1930 | 3,000 records as of Dec. 1980 1,000 records added annually | | |
| Badaduq - Banqueau | 1 | 1,2,3 | 1 | French language references on all aspects of water. | INRS - Eau | Service de la documentation I.R.N.S. - St.Foy, Québec | F | 1 | 1970 | 7,000 records as of Dec. 1980 600 records added annually | | |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Banker - American Banker Index | 1 | 1,2,3 | 1 | Citations to all articles and news items appearing in the America Bankers. | American Banker | INFOMART, Toronto | E | 2 | Jan. 1979 | 34,361 records as of Sept. 1980 updated monthly | | $80*/hr. + $8*/hr. telecom. $.15/ print offline |
| BADAVUM | 3 | 1,2,3 | 2 | Multidisciplinary with special emphasis on stage, theatre and audit-visual. | Centre de documentation audio-visuelle et la théatrothèque, l'Université de Montréal | Centre de documentation audio-visuelle et la théatrothèque, l'Université de Montréal | F | 3 | 1974 (1968) | 8,000 records update weekly annual growth about 3,000 | | University centre rates |
| BTQ/Banque de terminologie du Québec | 3 | 1,2,3 | 2 | Terminology data bank (French) | Office de la banque française du Québec Montréal | Office de la banque française du Québec Montréal | F | 1,3 | 1973 (1940) | 600,000 and 24,000 reference monthly update annual growth 36,000 terms and 3-4,000 references | | $45/hr./Note: Other special tariffs available |

## REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BHRA Fluid Engineering | 1 | 1,2,3 | 1 | Information on theory, applications, and research and dev. studies in Fluid engineering. | British Hydro-mechanics Research Association, Cranfield, Bedford, U.K. | DIALOG Lockheed | E | 1 | 1974 | 58,800 records as of Dec. 1980 600 records added annually | | $50*-$65*/hr.+ $.15/print offline. Plus $5 or $8/hr. telecom. |
| BIBLIOCOM | 1 | 1,2,3 | 1 | French language articles from journals, books, research reports etc., on all aspects of communications. | Informatech France - Quebec; Montreal | Same as source. | F | 3 | 1976 | 2,300 records as of Dec. 1980 2,500 records added annually | | |
| BIBLIOL - IDRC Library Holdings | 1 | 1,2,3 | 1 | Literature servicing needs and objectives of the International Development Research Centre. | IDRC, Ottawa | IDRC, Ottawa | E | 3 | 1970 | 29,863 records as of Feb. 81 daily updates | | available to public and non-profit sector on experimental basis |
| BIOCODES | 1 | 1,2,3 | 1 | Each record contains a 5-digit code used in BIOSIS that is either a Taxonomic or Category Code. | Biosciences Information Service and Biological Abstracts, Philadelphia | INFOMART, Toronto | E | 1 | Jan. 1969 | 1,293 records monthly | | $45*/hr. + $8*/hr. telecom. $10/record for offline prints |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bioethicsline | 1 | 1,2,3 | 1 | References to documents which disuss value questions arising from health care or biomedical research. | U.S. National Library of Medicine | CISTI | E,F | 3,4 | Jan. 1973 to Nov. 1978 | updating monthly | | $15*/hr. during prime time. $8*/hr. non-prime time. $.15*/page of offline print + $4 per hour telecom. charge |
| Biography Master Index | 1 | 1,2,3 | 1 | Index to biographical info. found in 600 source publications. | Gale Research Detroit, Mich. | DIALOG Lockheed | E | 3,4 | | 3,000,000 records as of Dec. 1980 | | $40*-$55*/hr.+ telecom. costs of $5* or $8*/hr. $.15/full record printed offline. |
| BIOSIS Previews | 1 | 1,2,3 | 1 | Biological abstracts contains references on all aspects of bioscience and biomedicine. | Biosciences Info. Service of Biological Abstracts, Philadelphia | DIALOG Lockheed | E | 1,4 | Jan. 1969 | 2,735,000 records as of Dec. 1980 monthly updates of 20,000 records | | $34*-$45*/hr.+ $5* or $8*/hr. telecom. $.10*/record for offline prints in File 55 and $.15* |

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| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BIOSIS Previews Biological Abstracts | 1 | 1,2,3 | 1 | References on all aspects of bioscience and biomedicine. | " | BRS Inc., New York | E | 1,4 | 1970 | monthly updates | | $33.60*/ connect hr. + $5.50*/hr. for telecom. $.05/page for offline printing. |
| BIOSIS/BIO6973 | 1 | 1,2,3 | 1 | References on all aspects of bioscience and biomedicine. | " | INFOMART, Toronto | E | 1,4 | Jan. 1969 | 2,704,000 records monthly updates of 14,000 records | | $65*+$8*/hr. telecom. $.10*/record offline prints SDI-$2.80 per update. |
| Books Information (BRS) | 1 | 1,2,3 | 1 | Citations to over 600,000 English-language monographs from U.S. publishers. | BRODART, Inc. | BRS-Bibliographic Retrieval Services, Inc., N.Y. | E | 3,4 | | 600,000 records as of March 1980 | | $27.50*/hr. online $5.50*/hr. telecom. |
| BOREAL (Boreal Library Catalogue) | 1,3 | 1,2,3 | 1 | Databank of acquisitions of the Boreal Inst. for Northern Studies Library. Since 1977. | Boreal Inst. for Northern Lib. | University of Alberta, Edmonton | E | 3,4 | 1977 | 10,125 records as of Feb. 1981 (annual growth 4,200 records) | | Univ. of Alberta Computer Service Charges |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boreal Northern Titles - BNT | 1,3 | 1,2,3 | 1 | Index to English titles and authors from publications received by the library of the Boreal Inst. for Northern Studies. | " | QL Systems Limited, Ottawa | E,F | 3,4 | Jan. 1972 | 64,563 records as of Nov. 1980 (annual growth of 12,000 records) | | $2.00/signon, $2.00/search, + $2.00/1,000 lines printed offline. |
| BR4 | 3 | 1,2,3 | 1 | Bibliographic references for region of Mauricie and Central Quebec. | Bibliothèque, Univ. de Trois-Rivières | Service de la documentation I.R.N.S. - St.Foy, Québec | F | 1,3 | 1975 | 8,500 records annual growth 500 records | | |
| BR1 | 3 | 1,2,3 | 1 | Bibliographic references for East Quebec (Region ). | " | " | F | | 1974 | 4,000 records annual growth 500 records | | |
| BRASSICA | 3 | 1,2,3 | 1 | Focuses on brassicals and associated oilseed crops. | Agriculture Canada Research Station Saskatoon | Agriculture Canada Research Station Saskatoon | E | 1 | 1970 (1920) | 10,000 records annual growth 500 records | | In-house. |

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| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CA Condensates-Chemical Abstracts Condensates | 1 | 1,2,3 | 1 | References on all aspects of chemistry and chemical engineering. | Chemical Abstracts Service, Ohio State | BRS-Bibliographic Retrieval Services, Inc., N.Y. | E | 1 | 1970 | ? | | $17.10*/connect hr. + $5.5*/hr. telecom. $.08/citation for offline printing |
| CA Search-Chemical Abstracts | 1 | 1,2,3 | 1 | References on all aspects of chemistry and chemical engineering. | Chemical Abstracts Service, Ohio State University | DIALOG Lockheed | E | 1 | 1967 | 4,104,400 records as of June 1979 | | $55*-$70*/hr.+ $5* or $8*/hr. telecom. $.20*/record for offline prints. |
| CAC and CAS - Chemical Abstracts Condensates | 1 | 1,2,4 | 1 | " " | " | C.I.S.T.I., N.R.C., Ottawa | E | 1 | July 1973 | ? | | $40*/connect hr. + royalty of $24*/hr. Add $.35/offline citation + royalty of $.08* per offline citation. Online document ordering: $2.20 minimum, 1-10 photocopied pages, 22¢/pg., microfiche duplicate at $2.20/report. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CALDOC - Calgary Documents | 1 | 1,2,3 | 1 | 2,500 records of primarily Canada and Calgary document held by Social Sciences Dept. of the Calgary Public Lib. | John Giehler, Social Sci. Dept., Calgary Public Lib. | Univ. of Alberta, Edmonton | E | 3,4 | | 2,500 records as of Jan 1981 | | University of Alberta current computing centre charges. |
| Canadian Air Pollution Technical Info. Information System | 1 | 1,2,3 | 1 | Information relating to air pollution. | Technical Information Section, Environment Canada, Ottawa | Same as source. | E | 1 | 1965 | 1,500 records as of June 1980 | | - |
| Canadian Business Index - CBI | 1,3 | 1,2,3 | 1 | Citations from Canadian trade and business publications. | Micro Media Limited, Toronto | QL Systems, Ltd., Ottawa | E,F | 2 | July 1975 | 229,264 records as of Nov. 1980 | | $2.00/signon, $2.00/search + $2.00/1000 lines printed offline. Surcharge - $14/connect hr. + $.15/ printout. |
| Canadian Business Index - CBPI | 1,3 | 1,2,3 | 1 | " " | Information Access, Toronto | Infomart, Toronto | E | 2 | 1975 | 170,935 records | | $75*/hr.+$8*/ hr. telecom. $.15/record offline SDI - $3.00/ update. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canadian Criminal Cases - CCC | 1,2 | 1,2,3 | 2 | Summaries of law reports w/decisions from all Cdn. courts, incl. Supreme Ct. Headnotes of the 2nd series (1971 - Sept. 25/79) of Canadian Criminal Cases. | Canada Law Book Ltd., Agincourt, Ont. | QL Systems Ltd., Ottawa | E | 4 | 1971 | 4,071 records as of March 1980 4,181 decisions Feb. 3, 1981 | | $2.00/signon, $2.00/search, $2.00/1000 lines printed offline. Surcharge - $3.00 per search. |
| Canadian Environment - CENV | 1,3 | 1,2,3 | 1 | Bibliographic refs. to water related scientific and related scientific and technical literature. | " | " | E | 1,4 | 1970 | 42,225 records as of Nov. 1980 (annual growth 7,200 records) | | $2.00/signon, $2.00/search, $1.50/1000 lines printed offline. |
| Canadian Newspaper Index - CNI | 1,3 | 1,2,3 | 1 | An index to major stories in Canadian newspapers. | Micromedia, Toronto | INFOMART, Toronto | E | 5 | 1977 | 149,254 records projected annual growth rate 72,000 records | | $75*/hr. + $8*/hr. telecom.; $15/record for offline prints. SDI - $3.00 per update. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canadian Newspaper Index - CNI | 1,3 | 1,2,3 | 1 | Index to major stories in various leargely circulated Canadian newspapers. | Micromedia Toronto | QL Systems Ltd., Ottawa | E,F | 5 | Jan. 1977 | 201,316 records as of Nov. 1980 | | $2.00/signon, $2.00/search, $2.00/1000 lines printed offline. Surcharge = $.14/hr. + $.15/document printed at QL. |
| Canadian Transportation Documentation System - CTDS | 1,3 | 1,2,3 | 1 | Coded portions of non-restricted documents from Transport Canada. | Transport Canada, Ottawa | C.I.S.T.I. | E,F | 1,5 | 1960 | 68,986 records as of March 1980 (annual growth 11,800 records) | | $45/connect. hr. + $.35/ offline print. |
| Cancerlit | 1 | 1,2,3 | 1 | Citations and abstracts from Cancer Therapy; Covers approx. 3000 journals. | U.S. National Medical Library. | C.I.S.T.I. | E | 1,4 | Jan. 1963 | 187,562 records as of Oct. 1979 | | $15*/hr. or $8*/hr. (depending on hours) $.15*/ page of off-line print + $5 to $10/hr. telecom. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cancerproj | 1 | 1,2,3 | 1 | Summaries of on-going cancer research projects from many countrie for most recent 3 years. Subset of Smithsonian Information Exchange File. | Lib. of Medicine Current Cancer Res. Projects Analysis Centre. | C.I.S.T.I. | E | 1,4 | 1975 | 19,904 records as of Oct. 1979 | | " |
| CANPLAINS | 1,3 | 1,2,3 | 1 | Covers all plains related research including environmental studies. | Canadian Plains Research Centre | Canadian Plains Research Centre, Univ. of Regina | E | 1,3,4 | 1975 | 10,000 records as of Dec. 1980 (annual growth rate 1,500 records) | | $15/search + computer and printing costs. Surcharge for search over 50 items. |
| Catalogue Support System (CATSS) | 1 | 1,2,3 | 1 | UTLAS, CATSS system enables an online catalog support system to be offered to libraries internationally. Offers a variety of products to support record editing. | UTLAS, Toronto | UTLAS, Toronto | E | 3,4 | 1973 | - | | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Catline | 1 | 1,2,3 | 1 | U.S. National Library of Medicine Cataloguing. | U.S. Nat. Lib. of Medicine, | C.I.S.T.I. | E | 4 | 1965 | 192,024 records as of Oct. 1979 | | $15*/hr. or $8*/hr. (depending on hours) $.15*/page of off-line print + $5* or $10*/hr. telecom. |
| CGOT- Canadian Govt. Office of Tourism - TDRC | 1 | 1,2,3 | 1 | Bibliographic information oriented to tourism, recreation, leisure, and related topics. | C.G.O.T., Ottawa | C.G.O.T., Ottawa | E | 5 | 1957 | 4,500 records as of Jan. 1981 | | - |
| Charging for Library Services | 1 | 1,2,3 | 1 | References to journal articles and reports describing pros & cons of charging for services in tax supported libraries. | Graduate School of Library Science, McGill, Univ. | QL Systems Ltd., Ottawa | F,E | 3 | 1974 | | | $2/signon, $2/search $2/1000 lines printed off-line |
| Chemical Abstracts/ CASIA, CHEMCON | 1 | 1,2,3 | 1 | References on all aspects of chemistry and chemical engineering. | Chemical Abstracts Service, Ohio State Univ. | INFOMART, Toronto | E | 1 | Jan. 1970 | 36,230,086 records | | $70*/hr.+$8*/hr. telecom. $.20*/record for offline prints. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chemical Industry Notes - CIN | 1 | 1,2,3 | 1 | Weekly compilation of brief extracts of articles concerning aspects of the chemical industry. | American Chemical Society, U.S.A. | " | E | 1,2 | 1974 | 246,541 records | | $75*/hr.+$8*/hr. telecom. $.20/offline print SDI - $2.50/update. |
| Chemical Industry Notes - CIN | 1 | 1,2,3 | 1 | " " | " | DIALOG Lockheed | E | 1,2 | 1974 | 260,000 records as of Jan. 1981 | | $45*-$60*/hr.+$5* or $8*/hr. telecom. $.20/full records for offline prints. |
| Chemline (NIM) | 1 | 1,2,3 | 1 | Chemical dictionary file for chemicals cited in Toxline which have Chemical Abstracts Service Registry numbers. | National Medical Library | C.I.S.T.I. | E,F | 1 | | 425,121 records as of Oct. 1979 | | $15*/hr. or $8*/hr. (depending on hours) $.15*/page of offline prints + $5 to $10* per hr. telecom. An additional $4* per hr. and $.02 per offline hit for royalties. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHEMNAME TM - Chemical Name Dictionary | 1 | 1,2,3 | 1 | CAS Registry numbers, CA Index names, molecular formulas and synonyms for chemical substances covered by CASIA. | Chemical Abstracts Service | DIALOG Lockheed | E | 1 | Jan. 1972 | 736,000 | | $55*-$70*/hr.+ $5* to $8*/hr. telecom. Off-line prints are $.20 per full record. |
| Chemsearch TM | 1 | 1,2,3 | 1 | Dictionary listing of the most recently cited chemicsl substances in CA Search, and a companion file to CHEMNAME. | " | " | E | 1 | | 45,000 (April, 1980) | | $40*-$55* per connect hr. + telecom. of $5* or $8*/hr. $.16/full record printed offline |
| CHEMSIS - TM | 1 | 1,2,3 | 1 | Dictionary file of CAS registry numbers, CA Index names, molecular formulas, synonyms, and ring data for substances cited once during a collective index period of Chemical Abstracts. | DIALOG TM | " | E | 1 | 1972 | 2,270,000 records as of July 1980 | | - |
| Chemx | 1 | 1,2,3 | 1 | Chemical index derived from the CA Search File. | (U.S.) | C.I.S.T.I. | E,F | 1 | Jan. 1979 | 915,623 records as of Sept. 1980 | | $40*/hr. + U.S. royalties of $24*/hr. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Child Abuse and Neglect | 1 | 1,2,3 | 1 | Descriptions of ongoing and completed research projects, excerpts of current State laws, and descriptions of service programs in child abuse and neglect. | National Center for Child Abuse & Neglect, U.S. Dept. of Health, Ed. and Welfare | DIALOG Lockheed | E | 3,4 | 1965 | 7,000 records as of Jan. 1981 | | $20*-$35*/hr.+ $5* or $8*/hr. telecom. $.10 per full record printed offline. |
| CIS - Congressional Information Service | 1 | 1,2,3 | 1 | Abstracting and indexing service providing an awareness of, and access to the info. content of the working papers of the U.S. Congress. | Congressional Information Service, Inc. Wash. D.C. | INFOMART, Toronto | E | 4 | Jan. 1970 | 118,641 records | | $100*+$8*/hr. telecom. $.25 per record for offline prints. |
| CIS - Congressional Information Service | 1 | 1,2,3 | 1 | " " | " | DIALOG Lockheed | E | 4 | 1970 | 110,000 records as of Jan. 1981 | | $75*-$90*/hr.+ $5* or $8* per hr. telecom. $.15*/each for offline prints. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CISTI Catalogue (OON) | 1 | 1,2,3 | 1 | Provides access to a subset of CISTI's holding including branch libraries' holdings catalogued since Jan. 1978 through UTLAS. | C.I.S.T.I., Ottawa | C.I.S.T.I., N.R.C., Ottawa | E | 1 | 1978 | 96,837 records as of Nov. 1980 | | $40/hr. $.35/offline citation. On-line document ordering - $2.20 min., 1-10 photo-copied pages, 22¢ each. $2.20/report. |
| Citizens Concerns Study | 1 | 1,2,3 | 1 | Data which supplements City of Edmonton's aggregate Stats. such as crime rates and traffic flow. | Office of the Mayor, City of Edmonton | Office of the Mayor, City of Edmonton | E | 3 | Sept. 1978 | 1,439 records as of Dec. 1979 | | - |
| CLAIMS/CHEM - U.S. Chemical Patents | 1 | 1,2,3 | 1 | U.S. chemical and chemically related patents plus some foreign equivalents. | IFI/Plenum Data Company Arlington, Va. | DIALOG Lockheed | E | 1 | 1950 | 265,000 records as of Jan. 1979 | | $80*-$95*/hr.+ $5* to $8*/hr. telecom. $.15/record for offline prints. |
| CLAIMS/CHEM - U.S. Patent Abstracts Weekly | 1 | 1,2,3 | 1 | Companion to CLAIMS TM/U.S. Patent Abstracts. | " | " | E | | | 3,000 | | Same as above except $.50/ record printed offline + $.25 per online record. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CLAIMS/CHEM/ UNITERM 1950-1970 | 1 | 1,2,3 | 1 | All U.S. chemical and chemically-related patents listed in chemical section of U.S. Patent Office official gazette. | IFI/Plenum Data Co., Arlington, Va. | DIALOG Lockheed | E | 1 | 1950 | 265,000 records as of 1970 | | $282*-$300*/ hr. + $5* or $8* per hr. telecom. $.15/ $.15/record printed off-line. |
| CLAIMS/CHEM/ UNITERM 1971-1977 | 1 | 1,2,3 | 1 | " " | " | " | E | 1 | 1971 | 148,515 | | " |
| CLAIMS/CHEM/ UNITERM 1978-present | 1 | 1,2,3 | 1 | " " | " | " | E | 1 | 1978 | 39,061 records as of Dec. 1979 | | " |
| CLAIMS/CLASS | 1 | 1,2,3 | 1 | Dictionary index to the U.S. Patent Office Classification Codes. | " | " | E | 1,(4) | | 96,000 | | $80*-95*/hr. + $5* or $8*/hr. telecom. $10/record printed online. |
| CLAIMS/U.S. Patents Abstracts '78-present | 1 | 1,2,3 | 1 | U.S. patents classified by U.S. Patents Office since beginning of 1978. | IFI Plenum Co., Arglington, Va. | DIALOG Lockheed | E | 1 | 1978 | 100000 records as of Jan. 1981 | | $80*-$95*/hr.+ $5* or $8* per hr. telecom. $.50/record printed off-line and $.25/ online record. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CLAIMS/U.S. Patents 1971-1977 | 1 | 1,2,3 | 1 | U.S. patents from 1971-1977. | " | " | E | 1 | 1971 | 517394 records as of 1977 | | $80*-$95*/hr. (depending on hrs.) $.15/record printed off-line. |
| Clinprot | 1 | 1,2,3 | 1 | Contains descriptions of drug trials with anti-replastic agents also of research in progress. | U.S. National Library of Medicine | CISTI | E,F | 1,4 | | 1669 records as of Oct. 1979 | | $15*/hr. or $8*/hr. (depending on hrs.) $.15/page of offline print + $5* to $10*/hr. telecom. |
| COAL - ABS (Coal Abstracts) | 1,3 | 1,2,3 | 1 | Bibliographic database of technical literature on coal technology. | Coal Technology Information Centre, Alberta Research Council. | University of Alberta, Edmondon | E | 1 | | 4,971 records as of Jan. 1981 (annual growth 2,400 records) | | Univ. of Alberta Computing Centre Charges |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cold Regions | 1 | 1,2,3 | 1 | Covers world literature in all scientific and technical subject areas pertaining to snow, ice, permafrost or frozen ground. | U.S. Library of Congress, Science and Tech. Div. | INFOMART | E | 1 | 1962 | 67,408 records | | $95*/hr.+$20*/record printed offline. Plus $8*/hr. telecom. |
| Commonwealth Agricultural Bureaux Abstracts-CAB | 1 | 1,2,3 | 1 | More than 8500 periodicals in 37 languages scanned annually by CAB - also books, reports and other publications. | Commonwealth Agricultural Bureaux, G.B. | DIALOG Lockheed | E | 1 | 1973 | 890,000 records | | $20*-$35*/hr.+ $5* or $8*/hr. telecom. costs. $.25/full citation and abstract. |
| Communications Information (COMM) | 1,3 | 1,2,3 | 1 | Covers communications, mass media, propaganda and telecommunications. | J. Black, University of Guelph, Ontario. | QL Systems Ltd., Ottawa | E,F | 1,3,5 | | 9,182 records as of Nov. 18/1980 (annual growth 2,000 records) | $2.00/signon, $2.00/search, $2.00/1000 lines printed offline. | |
| Comprehensive Dissertation Index | 1 | 1,2,3 | 1 | References to U.S. doctoral dissertations, Cdn. Dissertation, and selected masters theses. | Xerox University Microfilms International, U.S.A. | DIALOG Lockheed | E | 4 | 1861 | 600,000 records as of Jan. 1981 | | $40*-$55*/hr.+ $5* or $8*/hr. telecom. costs. $.12/ $.12/record for offline prints. |

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| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conference Papers Index | 1 | 1,2,3 | 1 | Latest ongoing research and development info. presented at 1000 conferences and meetings throughout the world. More than 100000 titles of papers indexed each yr. for retrieval. | Data Courier, Inc., Louisville, Ky. | INFOMART, Toronto | E | 1,4 | 1973 | 732,611 records | | $75*/hr. and $.25*/citation for offline prints. Plus $8*/hr. tele-com. costs. SDI - $4.50* per update. |
| Conference Papers Index | 1 | 1,2,3 | 1 | " " | " | DIALOG Lockheed | E | 1,4 | Jan. 1973 | 670,000 records as of Jan. 1981 | | $58*-$73*/hr.+ $5*-$8*/hr. telecom. costs. $.20/offline print. |
| Congressional Record | 1 | 1,2,3 | 1 | Comprehensive abstracts covering each issue of the Congressional Record. | Capitol Services, Inc., Wash. D.C. | " | E | 4 | 1976 | 205,000 records as of Dec. 1980 | | $60*-$75*/hr.+ $5* or $8*/hr. telecom. costs. $.15/ record printed offline. |
| Congressional Record - CRECORD | 1 | 1,2,3 | 1 | Record of transactiosn on floor of U.S. Congress. | Capitol Services, Inc., Wash. D.C. | INFOMART, Toronto | E | 4 | Jan. 1976 | 181,476 records | | $95*/hr.+$8*/ hr. telecom. $.25/record printed off-line. |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cooperative Documents Project (CODOC) | 1 | 1,2,3 | 1 | Produced by 11 academic libraries in Ontario and providing access to separate gov't. publications collections of the participating libraries. | Library, University of Guelph | C.I.S.T.I., N.R.C., Ottawa | E | 4 | 1970 | 505,980 records as of Nov. 1980 | | $45*/hr. $.35/offline citation. |
| CRDS - Chemical Reactions Documentation Service | 1 | 1,2,3 | 1 | Citations to worldwide journal and patent literature on new and improved methods in organic synthesis. | Derwent Publications | Infomart, Toronto | E | 1 | 1942 | - | | $100*/hr.+$5* or $8*/hr. telecom. $.13*/offline citation. |
| Current Research Information System | 1 | 1,2,3 | 1 | Current research in agriculture and related sciences. | U.S. Dept. of Agriculture | DIALOG Lockheed | E | 1 | July 1974 | 31,000 records as of Jan. 1981 | | $25*-$40*/hr.+ $5* or $8*/hr. telecom. $.10/ record printed offline. |
| Data Base Index | 1 | 1,2,3 | 1 | File DBI, master index to all Infomart databases, provides method for selecting appropriate databases for any given subject. | INFOMART, Toronto | Same as source. | E | 4 | - | - | | $45*/hr. + $8*/hr. telecom. |
| Data Reference (D-REF) | 1,3 | 1,2,3 | 1 | Detailed references to Cdn. data collections and data systems on water resources, lands, forestry and wildlife. | WATDOC, Environment Canada | QL Systems, Ottawa | E | 1 | 1976 | 855 records as of Nov. 1980 (annual growth rate 250 records) | | $2/signon, $2/search, $2/1000 words printed offline. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Delft Hydraulics Laboratory | 1 | 1,2,3 | 1 | References W/abstracts, to world literature of all types on hydrology and related subjects. | Technische Hoogeschool Delft Netherlands | " | E | 1 | 1975 | 5,993 records as of Nov. 1980 | | " |
| DEVSISL - Development Science Information System | 1 | 1,2,3 | 1 | Info. system covering literature on the economic and social aspects of Third World development. | I.D.R.C., Ottawa | Same as source. | E | 3 | 1975 | 3,639 records as of Feb. 1981 | | - |
| DIALINDEX (Lockheed) | 1 | 1,2,3 | 1 | Online directory to DIALOG databases. | Lockheed | DIALOG Lockheed | E | 4,5 | - | - | | $20*-$35*/hr.+ telecom. of $5* or $8*/hr. |
| DIALOG Publications | 1 | 1,2,3 | 1 | Contains descriptions of DIALOG Information Retrieval Service Publications. | Lockheed | " | E | 4,5 | - | - | | $15*/hr.+$5* or $8*/hr. telecom. costs. |
| Directory of Federally Supported Research in Universities - IEC | 1 | 1,2,3 | 1 | National repository for university-based research projects. | C.I.S.T.I. | C.I.S.T.I. | E | 3 | 1971 | 86,740 records as of July 1980 | | $40/hr.+$.35/ offline print-out. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disclosure | 1 | 1,2,3 | 1 | Extracts of reports filed with the Securities and Exchange Commission (SEC). | M. Bayer, Disclosure, Inc., Wash., D.C. | DIALOG Lockheed | E | 2,4 | Jan. 1978 | 100000 records as of Jan. 1981 | | $45*-$60*/hr.+ $5* or $8* telecom. costs. $5/off-line print in format 5; $3/ online print in format 5. |
| Dissertation Abstracts | 1 | 1,2,3 | 1 | Doctoral dissertations granted by U.S. educational institutions and over 125 non-U.S. universities. | Xerox University Microfilms, Ann Arbor | INFOMART, Toronto | E | 4 | 1861 | 655302 records | | $55* + $8*/hr. telecom. costs. $.12/ record for offline prints. |
| Dissertation Abstracts | 1 | 1,2,3 | 1 | " " | University Microfilms, International, U.S.A. | BRS-Bibliographic Retrieval Services, Inc., N.Y. | E | 4 | " | | | $8.55/connect hr.+$5.50/hr. telecom. costs. |
| DOANE | 1 | 1,2,3 | 1 | Covers literature of agricultural and abribusiness practice, production, products, and marketing. Also known as DICIS-DOANE Information Center Indexing Service. | DOANE Agricultural Service Inc. | INFOMART Toronto | E | 1,2 | Sept.1955 | 16297 records as of Nov. 1980 | | $2/signon, $2/search, $2/1000 lines printed off-line. Surcharge of $3/search. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dominion Law Reports - DLR (See also DLO) | 1,2 | 1,2,3 | 1 | Test database containing headnotes of all Canadian and criminal civil cases reported in 3rd series of Dominion Law Reports. | Canada Law Book Ltd., Agincourt | QL Systems Ltd., Agincourt | E | 4 | Sept.1955 | 16,643 as of summer 1981 | | $2/signon, $2/search, $2/1000 lines printed off-line. Sur-charge = $3/ search. |
| Dunn and Bradstreet | 1 | 1,2,3 | 1 | Statistics defined by Data Types (business, city, employees, etc.) for com-panies in cities throughout Canada. | Dunn and Bradstreet | - | E | 2 | | 600 records as of Aug. 1977 (must be more ?) | | |
| Economics - ECON | 1 | 1,2,3 | 1 | Reference index to world-wide selection of articles and books concerning economics and related subjects. | Intl. Comm. for Social Science Information and Docu-mentation | QL Systems Ltd., Ottawa | E | 2 | 1979 | 1,882 records as of Nov. 1980 | | $2/signon, $2/search, $2/1000 lines printed off-line. |
| Economics Abstracts International | 1 | 1,2,3 | 1 | Abstracts from world liter-ature on markets, invest-ment climate, and economic situations in all countries and branches of industry. | Economic Service of the Dutch Info. Ministry for Economic Affairs | DIALOG Lockheed | E | 2,4 | 1974 | 80,500 records a of Jan. 1981 | | $50-$65*/hr.+ $.20*/record printed off-line, + $5* or $8*/hr. tele-com. costs. |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Educational Resources Information Center - ERIC | 1 | 1,2,3 | 1 | Covers citations, including abstracts, published mthly. in Research in Education and Current Index to Journals in Education. | ERIC Processing & Reference Facility, Maryland. | BRS-Bibliographic Retrieval Services, Inc., N.Y. | E | 4 | 1966 | | | $17.10/hr.+ $5.50/hr. telecom. costs. |
| Educational Resources Information Center - ERIC | 1 | 1,2,3 | 1 | " " | Educational Resources Information Center, Wash., D.C. | INFOMART Toronto | E | 4 | 1966 | 376,809 records | | $35*/hr.+$8*/ hr. telecom costs. $.10/ offline print SDI-$2.50*/ update. |
| Educational Resources Information Center - ERIC | 1 | 1,2,3 | 1 | " " | " | DIALOG Lockheed | E | 4 | 1966 | 402,262 records as of Sept. 1980 | | $8*-$25*/hr.+ $5* or $10*/ hr. telecom costs. $.10/ record for offline prints. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EI - Computerized Engineering Index | 1 | 1,2,3 | 1 | Contains references to all aspects of engineering; over 3000 journals are monitored. | Engineering Index, Inc., N.Y. | C.I.S.T.I. | E,F | 1 | Jan. 1970 | 914,688 records as of Nov. 1980 | | $40/hr.+$16*/hr. royalty. $.35/offline citation;$.06*/offline cit.; $.06*/online cit.;royalties are $25*/hr., $.10*/citation printed online or offline. Online document ordering - $2.20 min. 22¢/photocopy; microfiche duplicated at $2.20/report. |
| EIS Industrial Plants | 1 | 1,2,3 | 1 | Information on U.S. Industrial Establishments of 20 or more employees. | Economic Information Systems, N.Y. | DIALOG Lockheed | E | 2 | | 142,000 records as of Jan. 1981 | | $75-$90/hr.+ $5 or $8/hr. telecom. costs. $.50/record for on-line and off-line prints. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EIS Non-manufacturing Establishments | 1 | 1,2,3 | 1 | Current info. on non-manufacturing establishments and firms employing 20 people in the U.S. | " | " | E | 2 | | 238,000 records as of Jan. 1981 | | " |
| ELCOM | 1 | 1,2,3 | 1 | International coverage of literature in 9 areas of electronics and computers, derived from 8,5000 periodicals and other sources. | Cambridge Scientific Abstracts Inc., Mass. | INFOMART Toronto | E | 1 | Aug. 1977 | 63,904 records | | $45*+$8*/hr. telecom. $.10/record for offline prints. |
| Electric Power Industry Abstracts - EPIA | 1 | 1,2,3 | 1 | Provides access to literature on electric power plants and related facilities. | - | " | E | 1 | 1975 | - | | - |
| Elias | 1 | 1,2,3 | 1 | Access to holdings of 15 libraries; includes fully catalogued records for series, monographs, conferences and technical reports. | Environment Canada, Departmental Library, Ottawa | C.I.S.T.I. | E,F | 1,4 | 1976 | 22,613 records as of Sept. 1980 (annual growth 3,600 records) | | $50/hr.+$.35/offline print. |
| ENC - Energy Calendar | 1,2 3 | 1,2,3 | 1 | Contains citations to an international calendar of energy conferences, seminars, etc. | EMR and others. | QL Systems Ltd., Ottawa | E,F | ,3,5 | | 28 records as of Nov. 18, 1980 | | $2/signon, $2/search, $2/1000 lines printed off-line. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Encyclopeida of Associations | 1 | 1,2,3 | 1 | Detailed info. on 14,000 non-profit American membership organizations. | Gale Research Company, U.S. | DIALOG Lockheed | E | 5 | | 15,101 records as of Jan. 1981 | | $40*-$55/hr.+ $.15/record printed off-line. Plus $5* or $8*/hr. telecom. costs. |
| Energy Projects - ENP | 1,2 3 | 1,2,3 | 1 | Abstracts of ongoing energy projects in Canada. | E.M.R.; Creb; C.S.L.; McNeil | QL Systems Ltd., Ottawa | E,F | 1 | | 690 records as of summer 1981 | | $2/signon, $2/search, $2/1000 lines printed off-line. |
| Energyline | 1 | 1,2,3 | 1 | Contains energy information abstracts from the Energy Information Centre. | Energy Information Centre, N.Y. | INFOMART, Toronto | E | 1 | Jan. 1971 | 26,171 records | | $90*/hr.+$8*/ hr. telecom. $.20/record printed off-line. |
| Energyline | 1 | 1,2,3 | 1 | Covers a range of scientific, technical, socio-economic, governmental policy and planning and current affairs info. | Environment Information Centre, U.S. | DIALOG Lockheed | E | 1 | " | 26,000 records | | $75*-$90*+$5* or $8*/hr. telecom. costs. $.20/. record for offline prints. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Engineering Index - COMPENDEX | 1 | 1,2,3 | 1 | 1600 regular professional and industrial journals as well as proceedings, transactions and special publications pertaining to engineering. | Engineering Index, Inc., N.Y. | INFOMART, Toronto | E | 1 | Jan. 1970 | 849,958 | | $80*/hr.+$5*-$10*/hr. telecom. costs. $.10/record offline prints. SDI - $2.82/update. |
| Engineering Index - COMPENDEX | 1 | 1,2,3 | 1 | " " | " | DIALOG Lockheed | E | 1 | " | 700,000 records as of Jan. 1981 | | $53*-$68*/hr.+$5 or $8/hr. telecom. costs. $.20/record for offline prints. |
| ENLIST | 3 | 1,2,3 | 1 | Engineering Library Index/ Scientific and Technical | Engineering Library Univ. of N.B., Fredericton | Engineering Library Univ. of N.B., Fredericton | E | 1 | 1968 (1950) | 110,000 titles (annual growth 15-20,000 titles) | | Univ. of N.B. Computing Centre Charges |
| ENP - Energy Programs | 1,2 | 1,2,3 | 1 | Description of federal and provincial energy programs. Identifies contacts for further information. | EMR and the provinces. | QL Systems Ltd., Ottawa | E,F | 1 | | 45 documents | | $2/signon, $2/search, $2/1000 lines printed off-line. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ENVIRODOQ | 1,3 | 1,2,3 | 1 | Relevés d'inventaires, évaluations environnementales rapports d'impact. | Ministère de l'environnement, Québec | INFORMATECH France - Québec | F | 1 | 1970 | 2000 records as of Dec. 1980 | | $40/hr. in Quebec, $70/hr. outside Quebec |
| ENVIRONLINE | 1 | 1,2,3 | 1 | Literature related to environmental studies, taken from journal literature, conference proceedings, govt. and institutional reports, newspapers and then sources. | Environmental Center, N.Y. | INFOMART, Toronto | E | 1,(5) | 1971 | 77002 records | | $90*+$8*/hr. telecom. costs. $.20/record for offline prints. |
| ENVIROLINE | 1 | 1,2,3 | 1 | " " | | DIALOG Lockheed | E | 1 | 1971 | 75000 records | | $75*-$90*/hr.+ $8* or $5*/hr. telecom. costs. $.20/record for offline prints. |
| Environmental Bibliography | 1 | 1,2,3 | 1 | Indexes 250 periodicals to provide info. on all aspects of environmental studies. | Environmental Studies Institute, California | DIALOG Lockheed | E | 1 | 1973 | 137,000 records | | $45*-$60*/hr.+ $5* or $8*/hr. telecom. costs. $.15/record for offline prints. |

## REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Environment - ENV | 1,3 | 1,2,3 | 1 | French lang. documents relevant to Canada's environment. | WATDOC, Environment Canada | QL Systems, Ottawa | E,F | 1 | | 599 records as of Nov. 1980 | | $2/signon, $2/search, $2/1000 lines printed off-line. |
| Exceptional Child Education Resources - ECER | 1 | 1,2,3 | 1 | Covers literature dealing with education of handicapped and gifted children. | Council for Exceptional Children, U.S. | BRS - Bibliographic Retrieval Services, Inc., N.Y. | E | 3,4 | 1966 | - | | $22.60*/hr. + $5.50*/hr. telecom. costs. |
| Exceptional Child Education Resources - ECER | 1 | 1,2,3 | 1 | " " | " | DIALOG Lockheed | E | 3,4 | Jan. 1966 | 35,000 records | | $10*-$25*/hr.+ $5* or $8*/hr. telecom. costs. $.10/ record for offline prints. |
| Excerpta Medica | 1 | 1,2,3 | 1 | Indexing and abstracting to over 3,500 worldwide biomedical journals. | Excerpta Medica, Amsterdam | DIALOG Lockheed | E | 4 | June 1974 | 1,280,000 records as of April 1980 | | $50*-$65*+$5* or $8* for telecom. costs. $.20/ record for offline prints. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EXTDOC | 3 | 1,2,3 | 1 | Business, management, law etc, re: aluminium industry. | Group Information Centre, Alcan, Montreal | Group Information Centre, Alcan, Montreal | E | 2,4 | 1977 | 2,000 records (annual growth 1,000 records) | | In-house. |
| FAO - Food and Agriculture Organization | 1 | 1,2,3 | 1 | Worldwide coverage of documents written by or for FAO on a variety of scientific topics. | Food and Agriculture Organiza-tion, Rome | IDRC, Ottawa | E | 1 | 1968 | 30,000 records as of Feb. 1981 | | |
| FEDEX | 1 | 1,2,3 | 1 | Provides access to a variety of information on U.S. government activities. | Predicasts, Inc., Cleveland | INFOMART, Toronto | E | 4 | Oct. 1976 | 155,326 records | | $90*/hr. + $8* telecom. costs. $.20/ record for offline prints. SDI = $3.50/ update. |
| Fedreg | 1 | 1,2,3 | 1 | Contains citations gathered daily from the Federal Register. | Capitol Services Inc., Wash., D.C. | INFOMART, Toronto | E | 4 | March 1977 | 88,371 records | | $95*/hr. and $25*/offline print. Also $8*/hr. tele-com. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Food Science and Technology Abstracts - FSTA | 1 | 1,2,3 | 1 | International coverage from periodicals, patents, books and conferences. | | INFOMART, Toronto | E | 1 | 1969 | 176,921 records | | $65*/hr.+$8*/hr. telecom. $.12/offline print. SDI = $3.50/update. |
| Food Science and Technology Abstracts - FSTA | 1 | 1,2,3 | 1 | " " | International Food Information Service, U.S. | Lockheed Information Systems | E | 1 | 1969 | 171,000 records | | $65/hr.+$5* or $10*/hr. telecom. costs. $.15/offline prints. |
| Foods Adlibra | 1 | 1,2,3 | 1 | Contains information on references to food industry developments. | K. & M. Publications, Inc. U.S. | DIALOG Lockheed | E | 1 | Jan. 1974 | 37,000 records | | $40*-$55*/hr.+ $.10*/offline print + $5* or $8* per hr. telecom. charges. |
| Forest Products - AIDS | 1 | 1,2,3 | 1 | Worldwide coverage of the entire wood products industry. | | INFOMART, Toronto | E | 1 | 1947 | 12,165 records | | $90*/hr.+$.20/offline prints. Plus $8*/hr. telecom. costs. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Foundation Directory | 1 | 1,2,3 | 1 | Descriptions of over 2,500 foundations with assets exceeding $1 million, from the Foundation Center. | Foundation Center, N.Y. | DIALOG Lockheed | E | 3 | | 3,200 records | | $45*-$60*/hr.+ $5* or $8*/hr. telecom. costs. $.30/ offline prints. |
| Foundation Grants Index | 1 | 1,2,3 | 1 | Grants records of more than 400 U.S. philanthropic foundations, from the Foundation Center. | The Foundation Center, N.Y. | DIALOG Lockheed | E | 3 | Jan. 1973 | 62,000 records | | $45*-$60*/hr.+ $5* or $8*/hr. telecom. costs. $.30/ offline prints. |
| FRANCIS | 3 | 1,2,3 | 1 | Multidisciplinary, education language, adminiatration, ethic-sociology, communication and information | Centre National de la Recherche Scientifique, Section CDSH, Paris, F. | Informatech Montreal | F | 2,3 | 1972 | 140,000 (annual growth rate 20%) | | $40/hr. in Quebec, $70/ hr. outside Quebec |
| France-Actualité | 3 | 1,2,3 | 1 | References to important articles in area of politics and economica in the major French Press (France) | Microfor Inc., Quebec | Microfor Inc., Quebec | E,F | 2,3 | 1978 | 77,000 records (annual growth 28,000 records updated monthly) | | $50/hr. in Europe (Note: Via European Space Agency) |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Frost and Sullivan DM2 | 1 | 1,2,3 | 1 | Covers U.S. Department of Defense contract awards. | Frost and Sullivan Inc., N.Y. | " | E | | 1975 | 225,000 records | | $75*-$90*/hr.+ $5* or $8*/hr. telecom. costs. $.25/ offline record. |
| Functional Equations Index | 1 | 1,2,3 | 1 | Bibliographic citations to articles on functional equations and their applications.... | Natural Sciences and Engineering Research Council, Ottawa | Univ. of Waterloo (Dept. of Pure Math. and Center for Info. Theory) | E | 3 | 1747 | 8,000 records | | |
| GAP - Government of Alberta Publications | 1 | 1,2,3 | 1 | Bibliographic records of publications of the Gov't of Alberta. | Alberta Public Bureau, Edmonton | Univ. of Alberta | E | 5(?) | 1905 | 14,441 records as of May 1980 | | Univ. of Alberta Computing Centre Charges |
| Geoarchive | 1 | 1,2,3 | 1 | Includes: 1) Geotitles Weekly; 2) Geocom Bulletin; 3) Geoscience Documentation and 4) Bibliography of Vertebrae Paleontol. | | DIALOG Lockheed | E | 1 | 1969 | 240,000 records as of May 1980 | | $55*-$70*/hr.+ $5* or $8*/hr. telecom. costs. $.20/ offline prints. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Geochemical Data System | 3 | | 1 | Geological data on areas in Saskatchewan. | Saskatchewan Research Council, Saskatchewan | Saskatchewan Research Council, Saskatchewan | E | 1 | 1972 | 50,000 recrods | | (In-house no charge). |
| GEODIAL | 1 | 1,2,3 | 1 | Reports with geological data sponsored by the Alberta Research Council. Uses GEOSCAN as input and Cdn, Society of Petroleum Geologists. | Alberta Research Council, Edmonton | Univ. of Alberta, Edmonton | E | 1 | | 4,331 records as of Sept. 1980 | | Univ. of Alberta Computer Charges |
| Geological References - GEOREF | 1 | 1,2,3 | 1 | Worldwide coverage of geosciences literature in 29 different fields. | American Geological Institute, Wash., D.C. | INFOMART, Toronto | E | 1 | Jan. 1967 | 587,133 records | | $95*/hr.+$8*/hr. telecom. $25/record for offline prints. SDI - $3*/update. |
| GEOREF | 1 | 1,2,3 | 1 | Worldwide coverage of the literature on geology and geophysics. | American Geological Institute, VA. | DIALOG Lockheed | E | 1 | 1961 | 640,000 records as of Dec. 1980 | | $50*-$65*/hr.+ $5* or $8*/hr. telecom. costs. $.20/record printed offline. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GEOSCAN | 1,3 | 1,2,3 | 1 | Identifies and indexes published and unpublished geological and related documents dealing with the Cdn. Landmass and its off-shore regions. Also geophysics including non-renewable mineral and energy resources. | Canada Centre for Geoscience Data, Ottawa | Same as source. | E | 1 | 1968 (1845) | 59,708 records as of Oct. 1980 (annual growth 6-7,000, updates 4/yr. | | |
| GPO Monthly Catalog | 1 | 1,2,3 | 1 | References to public documents under the provenance of U.S. Fed. Gov't Agencies. | Superintendent of Documents, U.S. Gov't Printing Office, Wash., D.C. | DIALOG Lockheed | E | 1,3,4 | July 1976 | 75,000 records as of May 1980 | | $20*-$35*/hr.+ $.10/offline record. Plus $5 or $8/hr. telecom. costs. |
| GPO Monthly Catalog | 1 | 1,2,3 | 1 | " " | " | BRS - Bibliographic Retrieval Services, N.Y. | E | 1,3,4 | " | 105,440 records as of Sept. 1980 | | " |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grants | 1 | 1,2,3 | 1 | Single source of reference to more than 1500 grant programs offered by U.S. federal, state, and local governments and private organizations. | Oryx Press, U.S. | INFOMART, Toronto | E | 3 | | 2,000 records as of Jan. 1980 | | $70*/hr.+$8*/hr. telecom. $.35/record for offline prints. SDI = $3.33/update. |
| Grants | 1 | 1,2,3 | 1 | " " | Oryx Press, U.S. | DIALOG Lockheed | E | 3 | | | | $40*-$50*/hr.+ $5* or $8*/hr. $.30/record printed off-line. |
| Hansard Oral Questions - HOQ | 1,2 3 | 1,2,3 | 1 | Data base (full text version) of questions and responses in the House of Commons in English Language. | House of Commons, Ottawa | QL Systems Ltd., Ottawa | E | (4) | Jan. 1973 | 29,316 as of Feb. 12, 1981 | | $2/signon, $2/search, $2/1000 lines printed off-line. |
| Hansard Questions Ecrites (HQO) | 1,2 3 | 1,2,3 | 1 | Data base (full text version) of questions in French Language-Written. | " | " | E,F | | 1973 | 12,600 questions and responses (annual growth 1,800) 13,026 Feb. 12, 1981 | | |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hansard Written Questions - HWQ | 1,2 3 | 1,2,3 | 1 | Data base (full text version) of questions in English Language-Written Correspondence to House of Commons debates official report. | " | " | E,F | (4) | " | 12,648 records as of Nov. 1980 | | " |
| Headnotes of the Federal Court of Canada Reports - FCR | 1,2 | 1,2,3 | 1 | Test data base of the headnotes of Federal Court of Canada Reports. | Federal Dept. of Justice, Ottawa | " | E,F | (4) | 1971 | 1,346 records as of Nov. 1980 | | " |
| Headnotes of the Supreme Court of Canada Reports - SCR | 1,2 | 1,2,3 | 1 | Test data base of the headnotes of Supreme Court of Canada reports from 1876 to date. | " | " | E,F | (4) | 1876 | 11,270 records as of Nov. 1980 | | " |
| Health Sciences Information in Canada | 3 | | 1 | Information relating to general health sciences collections in Canada. | CISTI Ottawa | CISTI Ottawa | E | 1,4 | 1978 | 1,600 records (annual growth 100 records) | | (via Health Sciences Resource Centre Staff) |
| HISCABEQ | 1,3 | 1,2,3 | 1 | French language references to articles taken from periodicals, these and other sources on the history of Quebec and Canada. | (Microfor Inc.) | Microfor Inc. | F | 3 | 1966 | 17,000 records as of Dec. 1980 (annual growth 2,000 records) | | |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Histline | 1 | 1,2,3 | 1 | History of medicine and related sciences, professions, individuals, institutions, drugs, and diseases given chronological areas. | U.S. National Library of Medicine, through C.I.S.T.I., Ottawa | C.I.S.T.I., Ottawa | E | 1,3 | | 37,837 records as of Oct. 1979 | | $15*/hr. during prime time. $8*/hr. non-prime time. $.15/ page of off-line prints. $4/hr. telecom. |
| Historical Abstracts | 1 | 1,2,3 | 1 | Articles from 2200 serials covering world's history in the social sciences and humanities. | ABC - Clio, Inc., U.S. | DIALOG Lockheed | E | 3 | 1973 | 54,000 records | | $50*-$65*/hr.+ $5* or $8*/hr. telecom. costs. $.15/ record for offline prints. |
| ICAR - Inventory of Canadian Agricultural Research | 1 | 1,2,3 | 1 | Inventory of agricultural and food related research and development in Canada. | Inventory Committee of the Canadian Agricultural Research Council, Ontario Ministry of Agricultural and Food Toronto | Research Branch Agricultural Canada | E,F | 1 | 1975 | 4,075 projects (annual growth 5%) | | (No charge via Research Branch |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IEA Coal Database | 1 | 1,2,3 | 1 | Consists of 4 projects of the International Energy Agency. | IEA Coal Research, Tech. Info. Service, London | C.I.S.T.I., Ottawa | E | 1 | July 1978 | 16,166 records as of Sept. 1980 | | $40/hr.+$5 - $10/hr. telecom. costs. $.35/citation printed off-line. |
| IEC - Information Exchange Centre for Federally Supported Research in Universities | 1 | 1,2,3 | 1 | References to university-based research projects, including medicine, science and technology. | CISTI Ottawa | CISTI Ottawa | F | 1,4 | 1971 | 90,000 records (annual growth 10,000 annual update) | | CAN/OLE charges |
| ILO - International Labor Organization | 1 | 1,2,3 | 1 | Worldwide coverge of journal and monographic literature in the field of economic and social development and industrial relations. | International Labor Organization, Geneva | IDRC, Ottawa | E | 3 | 1968 | 60,000 records as of Feb. 1981 | | |
| InfoGlobe Globe and Mail | 1,2 | 1,2,3 | 1 | Full-text online articles on all subject matter which has appeared in the "Globe and Mail" since Nov. 17, 1977. Report on Business from January 1, 1978. | The Globe and Mail, Toronto Infoglobe | The Globe and Mail, Toronto Infoglobe | E | 5 | Nov. 1977 | | | 2/min. connect, $105/hr. $3-$2.50/1000 lines of off-line prints. |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Information Service in Mechanical Engineering - ISMEC | 1 | 1,2,3 | 1 | References from journal articles, etch. reports, etc. on mechanical engineering, production, and engineering management. | Data Courier Inc., Louisville, Ky. | INFOMART, Toronto | E | 1 | 1973 | 99078 records | | $75*/hr.+$8*/hr. telecom. $.25/offline print. SDI = $4.50*/update. |
| Information Service in Mechanical Engineering - ISMEC | 1 | 1,2,3 | 1 | Articles etc. on mechanical engineering, including an online Thesaurus. | " | DIALOG Lockheed | E | 1 | 1973 | 89000 records | | $58*-$73*/hr.+ $5* or $8*/hr. telecom. costs. $.15*/record for offline prints. |
| INSOIL - Insect Pests of Oilseed Crops | 3 | 1,2,3 | 1 | All aspects of occurrence of damage, control of insects of oilseed crops. | Agriculture Canada Research Station, Saskatoon | Agriculture Canada Research Station, Saskatoon | E | 1 | 1970 (1920) | 2,000 records (annual growth 150) | | (None in-house). |
| Inpadoc - International Patent Documentation Center | 1 | 1,2,3 | 1 | Listing of new patents issued in 47 countries. | IPDC, Arlington, VA. | DIALOG Lockheed | E | 4 | | 1,000,000 records | | $80*-$95*/hr.+ telecom. costs of $5* or $8*/hr. $.20/off-line record. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INSP - Institute of Electrical Engineers | 1 | 1,2,3 | 1 | References on all aspects of physics, electronics, electrical engineering, computers and control from the Inst. of Electrical Engineers. | Institute of Electrical Engineers, London | C.I.S.T.I., N.R.C., Ottawa | E | 1 | Jan. 1970 | 1,479,924 records as of Sept. 1980 | | $40/hr. + royalties of $30*/hr. $35/offline citation + $.10*/each royalties. Online document ordering - $2.20 min. microfiche - $2.20/report. |
| INSPEC - Institute of Electrical Engineers | 1 | 1,2,3 | 1 | Worldwide coverage of physics, electrical engineering, computer science and control engineering. | " | BRS - Inc., N.Y. | E | 1 | 1969 | | | $39.10/hr. and $5.50/hr. telecom. costs. $.10/ offline citation. |
| INSPEC- Institute of Electrical Engineers | 1 | 1,2,3 | 1 | " " | " | INFOMART, Toronto | E | 1 | 1970 | 428,708 records | | $65*+$8*/hr. telecom. $.15/ offline prints. SDI - $5/update. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| INSPEC - Institute of Electrical Engineers | 1 | 1,2,3 | 1 | Worldwide coverage of physics, electrical engineering, computer science and control engineering. | Institute of Electrical Engineers, London | DIALOG Lockheed | E | 1 | Jan. 1969 | 160,000 records as of Jan. 1979 | | $55-$70+$5 or $8/hr. telecom. costs. $.20/record for offline prints. |
| International Pharmaceutical Abstracts - IPA | 1 | 1,2,3 | 1 | Indexes more than 1000 pharmaceutical, medical and related journals - for information on all phases of deve. and use of drugs and on professional pharmaceutical practice. | American Soc. of Hospital Pharmacists, Wash., D.C. | DIALOG Lockheed | E | 4 | 1970 | 5,148,000 records | | $35*-$50*/hr.+ $5* or $8*/hr. telecom. costs. $.15/ record for offline prints. |
| Inventory of Canadian Agricultural Research - ICAR | 1 | 1,2,3 | 1 | Inventory of agricultural and food related research and development in Canada. | Agriculture Canada, Research Branch, Ottawa | AC, Ottawa | E | 1 | 1978 | 4,075 records as of Dec. 1980 | | |
| IRL Life Sciences Collection | 1 | 1,2,3 | 1 | Abstracts and bibliographic citations from research in major scientific areas. | Information Retrieval Ltd., N.Y. | DIALOG Lockheed | E | 1 | Jan. 1988 | 225,000 records as of April 1980 | | $30* - $45*/ hr. + $.15*/ record printed offline. + $5* or $8*/hr. offline print. SDI = $2.50/ |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Index KWIL des documents de l'IREQ | 3 | 1,2,3 | 1 | Electrity and related subjects. | Institut de recherche de l'Hydro-Québec, Varennes, Québec | Institut de recherche de l'Hydro-Québec, Varennes, Québec | E,F | 1 | 1970 | 20,000 records (annual growth 5,000) | | Free. |
| LABORDOC | 1 | 1,2,3 | 1 | Covers worldwide journal, report and monographic lit. in the field of economic and social development and industrial relations. | International Labor Orga., Geneva | INFOMART, Toronto | E | 3,2 | 1965 | 84,526 records | | $90*/hr.+$8*/hr. telecom. $.20*/offline print. SDI = $2.50/update. |
| LRIS - Land Related Information Systems Bibliography | 1,3 | 1,2,3 | 1 | Land related info. systems and issues related to their creation and use. | LRIS Coordination Projects, Alberta Treasury Dept. | Same as source. | E | 1 | 1970 | 1,500 records as of June 1980 (annual growth 300, bi-annual update) | | In-house no charge. |
| Language and Language Behaviour Abstracts - LLBA | 1 | 1,2,3 | 1 | World lit. on speech and language pathology, from Sociological Abstracts Inc. | Sociological Abstracts Inc., U.S. | DIALOG Lockheed | E | 3 | 1973 | 330,000 records | | $40 - $55/hr.+ $5 or $8/hr. telecom. costs. $.15/record printed offline. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Legal Resource Index - LRI | 1 | 1,2,3 | 1 | Complete indexing of key law and law-related literature. | Information Access Corp., CA. | " | E | 4 | Jan. 1980 | 18,000 records as of June 1980 | | $75* - $90*/hr. + $5* or $8*/hr. telecom. costs. $.20/offline prints. |
| Library and Information Science Abstracts - LISA | 1 | 1,2,3 | 1 | Literature in Library and Information Science in 20 language from 300 sources. | | INFOMART, Toronto | E | 1,3,4 | 1969 | 32,416 records | | $50*/hr.+$8*/hr. telecom. $.10/offline print. SDI = $5.50*/update. |
| Library of Congress Holdings - LIBCON | 1 | 1,2,3 | 1 | Covers all subject areas in monographic literature, audiovisual materials, books and periodicials. | Library of Congress, Wash., D.C. | " | | | Jan. 1965 | 1,104,552 records | | $120*/hr.+$8*/hr. telecom. 25¢/offline print. |
| LISA - Library and Information Science Abstracts | 1 | 1,2,3 | 1 | Worldwide coverage of journals, bullettins, etc. in the fields of library and information science, as well as publishing and bookselling. | | DIALOG Lockheed | E | 1,4 | 1969 | 32,000 records | | $35*-$50*/hr.+ $5* or $8*/hr. telecom. costs. $.10/offline print. |
| Magazine Index | 1 | 1,2,3 | 1 | Provides broad coverage of the general magazine literature. | Information Access Corp. CA. | " | E | 5 | 1977 | 316,000 records as of May 1980 | | $60-$75/hr.+ $5 or $8/hr. telecom. costs. $.20/offline print. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Management Contents | 1 | 1,2,3 | 1 | Indexes and abstracts articles from foreign and U.S. journals and other sources on business management related topics. | Management Contents Inc., Skokie, Ill | BRS - Inc., N.Y. | E | 2 | 1974 | | | $44.60*/hr.+ $5.50*/hr. telecom. $.05*/citation for offline prints. |
| Management Contents | 1 | 1,2,3 | 1 | Indexes and abstracts articles from foreign and U.S. journals and other sources on business management related topics. | Management Contents Inc., Skokie, Ill | INFOMART, Toronto | E | 2 | 1974 | 71,733 records | | $75*/hr.+$8*/ hr. telecom. 15¢/record for offline prints. SDI - $5*/update. |
| Management Contents | 1 | 1,2,3 | 1 | " " | " | DIALOG Lockheed | E | 2 | 1974 | 65,000 records | | $55*-$70*/hr.+ $5* or $8*/hr. telecom. costs. $.15/ record for offline print. |
| MEDS - Marine Environment Data Services | 1,3 | 1,2,3 | 1 | Contains hydrographic and oceanographic information (bibliographic and numeric). | Marine Environmental Data Services, F & O., Canada | Same as source. | E,F | 1 | 1970 | About 500,000 (annual growth 5%) | | (In-house no charge). |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Medline | 1 | 1,2,3 | 1 | Citations from 3100 medical and biomedical journals. | U.S. National Library of Medicine, | CISTI | E | 4 | Jan. 1977 | 595,357 records as of Oct. 1979 | | $15*/hr. or $8*/hr. (depending on hours) $.15*/ page of off-line print + $5* or $8*/hr. telecom. charge. |
| Mental Health Abstracts | 1 | | | Abstracts information on all aspects of mental health and illness. | Nat. Clearing-house for Mental Health Information of NIMH. | DIALOG Lockheed | E | 4 | 1969 | 375,000 records as of Dec. 1980 (monthly updates of 3,500 records) | | $15*-$30*/hr.+ $5* or $8*/hr. telecom. costs. $.10/ record for offline prints. |
| MESH Vocabulary | 1 | 1,2,3 | 1 | Unit Records for all Medical Subject Headings and all qualifiers. Includes annotations and history notes. | U.S. National Library of Medicine. | C.I.S.T.I. | E | 4 | | 14,819 records s of Oct./79 yearly updates | | $15* or $8*/hr (depending on times used); 15¢*/page of offline print+ $5* or $10*/hr .telecom costs |
| MET - Metal Abstracts | 1 | 1,2,3 | 1 | Covers all aspects of metals, metallurgy and related subjects. | American Society for Metals, Ohio | QL Systems Ltd., Ottawa | E | 1 | 1974 | 293,000 records as of Nov./80 | | $2/signon, $2/search + $2/1000 lines printed offline |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Metadex - Metal Abstracts | 1 | 1,2,3 | 1 | World wide metallurgical literature including Metal Abstracts Index and Alloys Index. | American Society for Metals, Ohio | DIALOG Lockheed | E | 1 | Jan. 1966 | 365,400 records as of June/80 monthly updates of 3,000 records | | $65-$80/hr. plus $5-$10/hr telecom. costs. $.12/record for offline prints. |
| Meterorological and Geoastrophysical Abstracts | 1 | 1,2,3 | 1 | Current citations for most important meteorological and geoastrophysical research published in world wide literature sources. | American Meterological Society, Boston, MA | DIALOG Lockheed | E | 1 | 1972 | 57,000 records as of June/80 irregular updating, averaging 600 records monthly | | $80*-$95*/hr. plus $5* or $10/hr. telecom costs. $.15/record printed offline |
| Microlog | 3 | 1,2,3 | 1 | Canadian report literature from government and institutional sources. | Micromedia, Toronto | CISTI | E,F | 2,3 | | 10,000 records | | Current CAN/OLE charges. |
| MINPROC Mineral Processing | 1 | 1,2,3 | 1 | Contains information relevant to Canadian mineral processing | CANMET (Canada Centre for Mineral & Energy Tech.) | Same as source<br><br>Tech. Info. Division; Ottawa | E | 1 | 1977 | 3,000 records as of June/80 | | Cost recovery basis. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MNT or MINTEL Mining Technology | 1,3 | 1,2,3 | 1 | Abstracted & keyworded references to literature on mining, technology & related topics. | CANMET Ottawa | QL Systems, Ltd., Ottawa | E,F | 1 | 1973 | 14,158 records as of Nov./80 (annual growth 1,2-1,500) | | $2/signon, $2/search, $2/1000 lines printed offline |
| MLA Bibliography | 1 | 1,2,3 | 1 | Corresponds to printed journal of the Modern Language Association, entitled MLA Bibliography | Modern Language Association of America | DIALOG Lockheed | E | 3,4 | 1976 | 77,500 records [quarterly updates] | | $40*-$55*/hr. & $.15/offline print. Plus $5* or $8*/hr. telecom. costs |
| Monitor | 1 | 1,2,3 | 1 | Citations to all articles & many columns that appear in all regional editions of the Christian Science Monitor | (Christian Science Monitor?) | INFOMART, Toronto | E | 3 | Jan. 1979 | 34,361 records as of Sept./80 | | $80*/hr. + $8* /hr. telecom. costs and $15/offline print |
| La Collection Moyen Nord | 1 | 1,2,3 | 1 | References to le Moyen-Nord québécois (between 49th and 58th parallel). | Service de Documentation, Centre de recherche du Moyen-Nord, Chicoutimi | Same as source. | F | | 1977 (1950) | 2,000 records (annual growth 500 updated monthly) | | via BADADUQ at libraries of Univ. du Québec. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MYCOTOX | ,3 | 1,2,3 | 1 | a list of fungi and the biologically active compounds each produces, with reference to the original scientific mention of the fungus & the compound | Atlantic Research Laboratory | Atlantic Research Lab., N.R.C. Halifax | E | 1 | 1977 | | | Free to NRC users. Others pay Dalhousie University Computering Centre charges |
| Name Authority | 1 | 1,2,3 | 1 | authority list for personal names, corporate names, & series decisions made by Nat. Lib. of Medicine | U.S. Nat. Lib. of Medicine, thru C.I.S.T.I | CISTI | E | 4 | 1965 | 106,521 records as of Oct./79 [weekly update] | | $15* or $8*/hr. (depending on times used) + $15/page of offline print & $5* to $10*/hr. telecom. charge |
| NCJRS - National Criminal Justice Reference Service | 1 | 1,2,3 | 1 | represents document collection of NCJRS, national & intl. clearinghouse of practical & theoretical info. about criminal justice & law enforcement established by U.S. Congress | NCJRS - Rockville, MD. (contact: Ms. Ah-Shun Chiang, Reference Service | DIALOG Lockheed | E | 4 | 1972 | 45000 records as of June/80 [1000 records/ mthly update] | | $20*-$35*/hr. + $5* or $8*/hr. telecom. costs $.10/online type & $.15/offline print |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NEIS - National Emissions Inventory System | 1,3 | 1,2,3 | 1,2 | information pertainint to air pollutant emissions in Canada | Air Pollution Control Directorate Environment Canada | same as source | E | 1 | 1974 | 400 records as of June/80 | | (Online used to publish every two years) |
| National Foundations | 1 | 1,2,3 | 1 | recent data on 21,000 U.S. private foundations which award grants for charitable foundations | Mr. J.Kulin The Foundation Center, NY | DIALOG Lockheed | E | 3 | 1975 | 21,800 records [annual updating] | | $45*-$60*/hr. + $.30*/off-line print Plus $5* or $8*/hr. telecom. costs |
| CAN/MARC 1976 National Library of Canada | 1 | 1,2,3 | 1 | CAN/MARC recorda from Jan. 76 to the present. Covers all subjects connected with Canada | National Library of Canada, Ottawa | C.I.S.T.I. | E | 3 | Jan. 1973 | 143,336 records as of Sept./80 [mthly updates of 2500 records] | | $40/hr. plus $.35/offline citation |
| National Newspaper Index | 1 | 1,2,3 | 1 | cover-to-cover indexing of: Christian Science Monitor, The New York Timea and The Wall Street Journal | National Newspaper Index, Information Access Corp., CA | DIALOG Lockheed | E | 3,5 | Jan. 1979 | 165,000 records as of May/80 [mthly updates of 15000 records] | | $60*-$75*/hr. + $.20/offline print. Plus $5* or $8*/hr. telecom. costs |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| National Rehabilitation Information Center | 1 | 1,2,3 | 1 | references to material on rehabilitation of the physically and mentally disabled | National Rehabilitation Information Center, Wash. DC | BRS - | E | 3,4 | 1956 | 3,000 records as of Dec./80 | | current charging schedule + $5.50/hr telecom. & $.05/office citation |
| NTIS National Technical Information Service | 1 | 1,2,3 | 1 | Complete Gov't Reports Announcements covering a broad range of disciplines of over 240 gov't agencies | National Technical Information Service, Springfield VA | BRS Inc., N.Y. | E | 1,3, 4,5 | 1970-1974 offline/ 1975 online | [mthly updating] | | $23.50/hr. + $5.50/hr. telecom. costs |
| NTIS National Technical Information Service | 1 | 1,2,3 | 1 | Complete Gov't Reports Announcements covering a broad range of disciplines of over 240 gov't agencies | National Technical Information Service, Springfield VA | C.I.S.T.I. | E | 1,3, 4,5 | Jan. 1971 | 556,059 records as of Oct./80 [mthly updates of about 6,000 records] | | $40/hr. plus $1/offline printout - online document ordering - $2.20 minimum |
| NTIS National Technical Information Service | 1 | 1,2,3 | 1 | Complete Gov't Reports Announcements covering a broad range of disciplines of over 240 gov't agencies | National Technical Information Service, Springfield VA | INFOMART, Toronto | E | 1,3, 4,5 | Jan. 1970 | 568,342 records [biweekly updates of 2,300 records] | | $45*/hr. plus $8*/hr. telecom. $.10/ record for offline prints SDI=$2.85*/ update |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NTIS National Technical Information Service | 1 | 1,2,3 | 1 | Complete Gov't Reports Announcements covering a broad range of disciplines of over 240 gov't agencies | National Technical Information Service, Springfield VA | DIALOG Lockheed | E | 1,3, 4,5 | Jan. 1964 | 725,000 records [biweekly updates of 2300 records] | | $25*-$40*/hr. + $5* or $8*/ hr. telecom. costs $.10/ record for offline prints |
| NEELS - National Emergency Equipment Locator System | ,2, 3 | 1,2,3 | 1,2 | Inventory of emergency containment & clean-up equipment known to be available in Canada and parts of the U.S. | Environ-ment Canada | I.P. Sharp Associates, Limited, Toronto | E,F | 1 | 1974 (1973) | 600 inventories | | current SHARP APL Time-sharing charges |
| New York Times Information Bank | 1 | 1,2,3 | 1 | Abstracts compiled from N.Y. Times and over 60 other world-wide publications | New York Times, N.Y. | Infomart | E | 5 | Jan. 1969 | 1,400,000 record [daily updating] | | $90-125/hr. offline print $3.50 + $.35 per abstract |
| NEWS | 1 | 1,2,3 | 1 | references w/summaries to water-related news stories from English-language Cdn. newspapers | WATDOC, Fisheries & Environment Canada | QL Systems Ltd. | E | 1,5 | 1971 | 47,993 records as of March/80 [biweekly updating] | | $2/signon, $2/search, $1.50/1000 lines printed offline |
| Newsearch | 1 | 1,2,3 | 1 | complete indexing of the Christian Science Monitor, New York Times & Wall Street Journal, plus 370 popular American newspapers | Information Access Corporation U.S. | DIALOG Lockheed | E | 5 | | [daily updates of 1500 records] | | $80*-$95*/hr., $.20/full record printed offline + $5* or $8*/ hr. telecom. costs |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NDEX - Newspaper Index | 1 | 1,2,3 | 1 | index to major stories covering a broad range of international, national, state and local news | Bell and Howell, Wooster, Ohio | INFOMART, Toronto | E | 5 | 1976 | 855361 records [mthly updates of 10000 records] | | $80*/hr. and $.15/offline print, + $8*/hr. telecom. costs |
| NICEM - National Information Center for Educational Media | 1 | 1,2,3 | 1 | contains references to all types of non-print educational media | National Information Center for Educational Media | DIALOG Lockheed | E | 4 | 1964 | 250500 records [twice yearly updates] | | $55*-$70*/hr. + $5* or $8*/hr. telecom. costs. Offline prints are $.10/record |
| NICSEM/NIMIS - National Info. Centre for Special Educational Materials | 1 | 1,2,3 | 1 | contains info. on audio-visual, print, Braille, equipment related to all educational levels of the handicapped (primarily children | NIMIS, L.A. CA | DIALOG Lockheed | E | 4 | | 36,000 records | | $20*-$35*/hr. + $5* or $8*/hr. telecom. costs. Offline prints are $.10/record |
| NIMH - National Clearinghouse for Mental Health | 1 | 1,2,3 | 1 | citations from over 1000 sources in the area of mental health | U.S. | BRS Inc. N.Y. | E | 4 | 1969 | 360,000 records [mthly updates of about 3,500 records] | | Current charging schedule plus $5.50*/hr. telecom. costs |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nonferrous Metals Abstracts | 1 | 1,2,3 | 1 | covers all aspects of non-ferrous metallurgy and technology from variety of sources | British Nonferrous Metals Technology Centre, England | DIALOG Lockheed | E | 1 | 1961 | 60,000 records as of May 80 | | $30*-$45*/hr., + $5* or $8*/hr. telecom. costs $.20/full record printed offline. $.10*/record typed online |
| News - Nouvelles (discontinued?) | 1,3 | 1,2,3 | 1 | references, with summaries, to water-related news stories from French language Canadian newspapers | WATDOC, Fisheries & Environment Canada | QL Systems Ltd., Ottawa | F | 1,5 | 1972 | 9,621 records as of March/80 [monthly updating] | | $2/signon, $2/search, $1.50/1000 lines printed offline |
| NRIS - Northern Research Information Service | 1,2 3 | 1,2,3 | 1 | contains information on over 800 research projects related to social concerns in the Canadian North | Northern Social Research Division, Dept. of Indian and Northern Affairs Ottawa | C.I.S.T.I. | E | 3 | 1976 | 852 records as of May/80 [annual updating, annual growth 500 records] | | $40/hr. plus $.35/offline printout |

## REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OEIC - Ocean Engineering Information Centre | 1,3 | 1,2,3 | I | Information in the field of Engineering Science related to development of offshore resources in Cold Oceans | Ocean Engineering Information Centre, Memorial Univ. Nfld. | Ocean Engineering Information Centre, Memorial University of Nfld. | E | I | 1976 (1975) | 15000 records as of June/80 [annual growth 2,000 records, 20,000 ext. maximum size] | | Subscription to index- $60/year for gov't and $95/year for industry. Searches are free to sponsoring organizations; $25/hr for other clients. |
| Oceanic Abstracts | I | 1,2,3 | I | worldwide coverage of oceanography and marine-related literature | Oceanic Abstracts, a division of Data Courrier, Ltd. Louisville, KY | INFOMART, Toronto | E | I | 1964 | 95,330 records [bimonthly updating] | | $75*/hr + $8* /hr. telecom. Offline prints are $.25/ record. SDI=$5*/update |
| Oceanic Abstracts | I | 1,2,3 | I | worldwide coverage of oceanography and marine-related literature | Oceanic Abstracts, a division of Data Courrier, Ltd. Louisville, KY | DIALOG Lockheed | E | I | Jan. 1964 | 110,500 records [bimonthly updates of 1,500 records] | | $58*-$75*/hr. +$5* or $8*/hr telecom costs. Offline prints are $.20 /record |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ontap CA Search (Special Training and Practice File) | 1 | 1,2,3 | 1 | contains chemical information which may be used to demonstrate the systems (CA search) to new users | Chemical Abstracts Service, Columbus, Ohio | DIALOG Lockheed | E | 1 | Oct. 1977 | 15,000 records | | $15x/hr. plus $5x or $8x/hr. telecom costs |
| ONTAP CHEMNAME (Practice and training file) | 1 | 1,2,3 | 1 | Chemical Substance information corresponding to the records in ONTAP CA SEARCH | | DIALOG Lockheed | E | 1 | Jan. 1970 | 25,000 records | | $5*/hr. plus $5* or $8*/hr. telecom costs |
| ONTAP ERIC (online receiving and practice) | 1 | 1,2,3 | 1 | a programmed instruction file, providing an opportunity for low-cost training and practice in online searching | Education Resources Information Centre, Wash. DC | DIALOG Lockheed | E | 4,5 | 1975 | 32,120 records | | $15*/hr. plus $5* or $8*/hr. telecom costs |
| OGI - Ontario Government Information | 1,2 | 1,2,3 | 1 | comprehensive references to Ontario Gov't programs and services. Based on KWIK index. | Government of Ontario | QL Systems, Ltd., Ottawa | E | 4,5 | 1978 | 761 records as of Nov./80 [updated irregularly] | | $2/signon $2/search $2/1000 lines printed off-line |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PAPERCHEM - Paper Chemistry | 1 | 1,2,3 | 1 | covers scientific & technical literature, including patents, of the pulp, paper and board manufacturing & utilizing industries, gathered from all industrialized countries | Institute of Paper Chemistry, Appleton, WI | INFOMART, Toronto | E | 1 | Jan. 1978 | 134,573 records [mthly updates of 1,000 records] | | NON-SUBSCRIBER $110*/hr. plus $.15*/record printed off-line<br>SUBSCRIBERS: $80*/hr. plus $.15/record printed off-line. Communication costs are $8*/hr. SDI=$3.50/update |
| PASCAL - Programme appliqué à la sélection et à la compilation automatique de la littérature | 1 | 1,2,3 | 1 | Pascal 1: Agriculture<br>Pascal 2: Sciences de la terre<br>Pascal 3: Sciences de l'information et électronique<br>Pascal 6: Chimie appliquée<br>Pascal 7: Energie<br>Pascal 8: Construction et métallargie | Centre National de la Recherche Scientific, Informascience Paris, France | INFORMATECH, Montréal | F | 1,2 3,4 | (1976) | Pascal 1: 45,000<br>Pascal 2: 45,000<br>Pascal 3:135,000<br>Pascal 5: 30,000<br>Pascal 6:120,000<br>Pascal 7: 60,000<br>Pascal 8: 90,000<br>[annual growth, 10 mthly updates] | | $40/hr. in Quebec $70/hr.outside of Quebec |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIRA - Paper Industries Research Institute | 1 | 1,2,3 | 1 | provides coverage of the paper, packaging & printing industries including management and marketing | Research Ass. for the Paper & Board, Printing & Packaging Industries, Leatherhead Surrey, Eng | DIALOG Lockheed | E | 1,2 | 1975 | 43,000 records [mthly updates of 800 records] | | $40*-$55*/hr. +$5* or $8*/hr telecom costs Offline prints are $.15/ record |
| Patsearch | 1 | 1,2,3 | 1 | contains all chemical, electrical, mechanical & general U.S. patents, with abstracts | Pergamon Intl. Info. Corp., Mclean, VA | BRS - Bibliographic Retreival Services, Inc. N.Y. | E | 1 | 1971 | 700,000 records as of Dec./80 [wkly updates of 1,200 records] | | $60*/hr. plus $5.50*/hr. telecom fees |
| PESTDOC Pesticidal Literature Documentation | 1 | 1,2,3 | 1 | provides journals, report & proceedings literature coverage of agricultural chemicals | Derwent Publications Ltd.London, England | INFOMART, Toronto | E | 1 | 1968 | 94,904 records [quarterly updates of 2,000 records] | | $100/hr. for subscribers, plus $8-$10/hr telecom. cost |
| P/E News - Petroleum Energy Business News | 1 | 1,2,3 | 1 | covers 5 major publications in the petroleum and energy fields | American Petroleum Institute, N.Y. | INFOMART, Toronto | E | 1 | Jan. 1975 | 146,978 records [weekly updates of 500 records] | | $95*/hr. plus $11*/offline print. $8*/hr. for telecom. costs |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PNI - Pharmaceutical News Index | 1 | 1,2,3 | 1 | contains the latest information affecting anyone involved with pharmaceutical cosmetics, devices and related industries | Data Courrier, Inc., Louisville, KY | BRS Inc. N.Y. | E | 1,2, 5 | 1975 | [mthly updates] | | $60.10*/hr. +us $5.50*/hr. telecom costs $.10/offline citation |
| PNI - Pharmaceutical News Index | 1 | 1,2,3 | 1 | contains the latest information affecting anyone involved with pharmaceutical cosmetics, devices, and related industries | Data Courrier, Inc. Louisville, KY | DIALOG Lockheed | E | 1,2, 5 | Dec. 1975 | 37,600 records [mthly updates of 1,000 records | | $75*-$90*/hr. +$5* or $8*/hr telecom. costs Offline prints are $.20/ record |
| Philosopher's Index | 1 | 1,2,3 | 1 | contains abstracts and bibliographic information on philosophy from a variety of sources | R.H. Linaback, Philosophy Documentation Center, Bowling Green State Univ., Ohio | DIALOG Lockheed | E | 4 | 1940 | 79,000 records [quarterly updates of 1,500 records] | | $40*-$55*/hr. +$5* or $8*/hr telecom costs $.15/offline print |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PIE - Pacific Islands Ecosystems | 1 | 1,2,3 | 1 | bological, ecological, physical, and socioeconomic processes & features of the coastal ecosystems of the Pacific Islands (Polynesia and Micronesia under U.S.) | U.S. | INFOMART, Toronto | E | 1 | 1927 | [annual updates of 4,000 records] | | $40*-$55*/hr. +$5* or $8*/hr telecom costs $.15/offline print |
| Pollution Abstracts | 1 | 1,2,3 | 1 | covers a variety of sources in the areas of pollution control and research | Data Courrier, Inc. Louisville, KY | BRS Inc. N.Y. | E | 1 | 1970 | [mthly updates] | | $55.60*/hr. + $5.50*/hr. telecom costs $.10*/ citation printed offline |
| Pollution Abstracts | 1 | 1,2,3 | 1 | covers a variety of sources in the areas of pollution control and research | Pollution Abstracts, Data Courrier, Louisville | INFOMART, Toronto | E | 1 | Jan. 1970 | 52,690 records [bimonthly updates of 1,000 records] | | $75*/hr, plus $8*/hr telecom costs Offline prints are $.25/record SDI=$5/update |
| Pollution Abstracts | 1 | 1,2,3 | 1 | covers a variety of sources in the areas of pollution control and research | Pollution Abstracts, Data Courrier, Louisville KY | DIALOG Lockheed | E | 1 | 1970 | 67,000 records as of Feb./80 [bimonthly updates of 1,000 records] | | $58*-$78*/hr. +$5* or $8*/hr telecom costs offline prints are $.20/record |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Population Bibliography | 1 | 1,2,3 | 1 | information on abortion, demography, migration, family planning, fertility studies, etc. - on Africa, Latin America, Asia & the Southeastern U.S. | Unviersity of North Carolina, Carolina Population Center | DIALOG Lockheed | E | 3 | 1966 | 44,000 records as of March/80 [bimonthly updates of 1000 records] | | $40*-$55*/hr. & $.10/full offline print +$5* or $8*/hr telecom costs |
| PPR - Periodicals Publishing Record | 1 | 1,2,3 | 1 | data on currently published Alberta Gov't periodicals available to the public | Alberta Public Affairs Bureau, Edmonton | University of Alberta, Edmonton | E | 5 | 1976 | 95 records as of Nov./80 [yearly updates] | | current charging schedule |
| PTSP - Promt-Predicasts | 1 | 1,2,3 | 1 | contains digests of articles from over 800 journals, newspapers, abstracts of studies, prospectuses & technical surveys | Predicasts, Cleveland, Ohio | BRS Inc. | E | 1 | 1972 | 316,232 records as of Oct./80 [monthly updating] | | $60*/hr. (non-academic) & $39*/hr (academic) $.10*/ citation offline |
| Psychological Abstracts | 1 | 1,2,3 | 1 | coverage of the world literature in psychology & other behavioral sciences, including an online Thesaurus | American Psych. Association Wash. DC | BRS Inc. N.Y. | E | 3 | 1967 | [monthly updates] | | $50.10*/hr. + $5.50*/hr. telecom costs |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Psychological Abstracts | 1 | 1,2,3 | 1 | coverage of the world literature in psychology and other behavioral sciences | American Psycho-logical Ass., Inc., Wash. DC | INFOMART, Toronto | E | 3 | 1967 | 279,380 records [monthly updates] | | $65*/hr. plus $8*/hr telecom Offline prints are $.10/ record SDI= $3.50/ update |
| Psychological Abstracts | 1 | 1,2,3 | 1 | coverage of the world literature in psychology and other behavioral sciences | American Psycho-logical Ass., Inc., Wash., DC | DIALOG Lockheed | E | 3 | 1967 | 288,000 records [monthly updates of 2,000 records] | | $50*-$65*/hr. $.10/full record off-line printed +$5* or $8*/hr telecom costs |
| PTS F&S (Funk & Scott) Indexes | 1 | 1,2,3 | 1 | information and references to articles relevant to all aspects of business & economics, domestic & international from a variety of sources | Predicasts Inc., Cleveland, Ohio | DIALOG Lockheed | E | 2 | Jan. 1972 | 1,385,000 records [monthly updates of 20,000 records] | | $59*-$90*/hr. +$5* or $8*/hr telecom costs offline prints are $.20/ record |
| PTS Federal Index | 1 | 1,2,3 | 1 | information on U.S. Gov't activities, abstracted from Congressional Record, Federal Register and other sources | Capital Service, Wash. DC | DIALOG Lockheed | E | 4 (5) | Oct. 1976 | 106,000 records [monthly updates of 5,000 records] | | $75*-$90*/hr. +$5* or $8*/hr telecom costs offline prints are $.20/record |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PTS International Statistical Abstracts | 1 | 1,2,3 | 1 | contains abstracts of all published forecasts for countries other than the U.S. | PREDICASTS Inc., Cleveland, Ohio | DIALOG Lockheed | E | 1 | 1971 | 280,000 records (monthly updates) | | $59*-$90*/hr. +$5* or $8*/hr telecom costs Offline prints & online types are $.20/ record $.50 for non-subscribers after 3 months |
| PTS International Time Series | 1 | 1,2,3 | 1 | annual data on international production, value of shipments, wages, prices, materials, consumption, foreign trade & end-use distribution for all different types of industries, products & services | PREDICASTS Inc., Cleveland, Ohio | DIALOG Lockheed | E | 1 | 1972 | 115,000 records (quarterly updates) | | $59*-$90*/hr. +$5* or $8*/hr telecom costs Online types & offline prints are $.20/ and $.50/ record for non-subscribers after 3 months |
| PTS Predalert | 1 | 1,2,3 | 1 | current records added on a weekly basis, then transferred to either PTS Prompt or PTS F&S Indexes | PREDICASTS Inc., Cleveland, Ohio | DIALOG Lockheed | E | 2 | 1971 | file contains current month only | | $59*-$90*/hr. +$5* or $8*/hr telecom costs Offline prints -$.20/print or $.50 for non-subscribers after 3 months |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PTS Promt | 1 | 1,2,3 | 1 | information on acquisitions, capacities, new products, regulations, technology, the marketing climate, consumer patterns, & the worldwide economy | PREDICASTS Inc., Cleveland, Ohio | DIALOG Lockheed | E | 2 | Feb. 1972 | 190,000 records as of Jan./79 [monthly updates of 3,000 records] | | $59*-$90*/hr. +$5* or $8*/hr telecom costs Offline prints -$.20/print or $.50 for non-subscribers after 3 months |
| PTS Promt - PREDALERT | 1 | 1,2,3 | 1 | reliable historical and projected data and reports on the state of technology, the marketing climate, consumer patterns & the worldwide economy | PREDICASTS Inc., Cleveland, Ohio | INFOMART, Toronto | E | 2 | 1972 | 943,998 records [weekly updates of 1,000 records] | | $120*/hr. and $.50/offline print $8*/hr telecom costs SDI=$3.50 per update |
| PTS Annual Time Series | 1 | 1,2,3 | 1 | information, historical data and projected concensus on the U.S. from 1957 to 1990 for more than 500 key economic, demographic, industrial and product time series | PREDICASTS Inc., Cleveland, Ohio | DIALOG Lockheed | E | 2 | 1957 | 350,000 records [quarterly updates] | | $59*-$90*/hr. +$5* or $8*/hr telecom costs Online types & offline prints are $.20/ and $.50/ record for non-subscribers after 3 months |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PTS U.S. Statistical Abstracts | | 1,2,3 | 1 | abstracts of published forecasts for the U.S. from trade journals, business & financial publications, key newspapers, gov't reports & special studies | PAIS, Inc., | DIALOG Lockheed | E | 2 | 1971 | 184,000 records [quarterly updates] | | $59*-$90*/hr. +$5* or $8*/hr telecom costs Offline prints are $.20/print or $.50/ record for non -subscribers after 3 months |
| PAIS - Public Affairs Information Service | 1 | 1,2,3 | 1 | material in English, French German, Italian, Portugese, Spanish, etc. in the field of social sciences, from a variety of sources | PAIS, Inc., | DIALOG Lockheed | E etc. | 2 | 1972 | 93,000 records [quarterly updates of 6100 records] | | $45*-$60*/hr. +$5* or $8*/hr telecom costs Offline prints are $.15/ record |
| Quebec - Actualité | 1,3 | 1,2,3 | 1 | abstracts from 3 major French-language newspapers of North America Coverage includes cultural, economic , political, religious & social aspects of life in Quebec | Microfor, Inc., Quebec | INFOMART, Toronto | E, F | 3,5 | Jan. 1973 (1966) | 153,705 records as of Dec.18/79 [mthly updates] 220,000 as of fall 1980 | | Subscribers: $75/hr. and $.10/offline print Non-subscriber $85*/hr + 10¢ /offline print; also $8/hr telecom costs SDI=$3/update |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RADAR - Répertoire analytique d'articles de revues du Québec | 3 | 1,2,3 | 1 | Multidisciplinary coverage of Quebec periodicals | Microfor Inc. Quebec | INFOMART | F | 1,2, 3,4 | 1978 (1973) | 50,000 records [annual growth of 9,000, bi-monthly updates | | $40/hr. in Quebec $70/hr. out-side of Quebec |
| RAPRA Abstracts | 1 | 1,2,3 | 1 | covers a variety of sources in the areas of pollution control and research | Rubbers & Plastics Research Ass., G.B. | DIALOG Lockheed | E | 1,2 | 1972 | 110,000 records [monthly updates of 1,800 records] | | $50*-$65*/hr. & $.15/record printed offline +$5* or $8*/hr telecom costs |
| RCA Unionlist - U. of A. | 1 | 1,2,3 | 1 | provides small libraries a vehicle through which they can automate and search their serial holdings in Alberta | Alberta Research Council Library, ARC | same as source | E | 4 | | 2,499 records as of Feb./81 | | current charges schedule |
| RTECS - Registry of Toxic Effects of Chemical Substances | 1 | 1,2,3 | 1 | contains chemical substan-ces with toxic dosages info. and synonyms for chemicals | Nat. Inst. for Occupa-tional Safety & Health, Nat.Lib. of Medicine. | C.I.S.T.I. | E | 1,4 | | 36,851 records as of Oct./79 [quarterly updates] | | $15 or$10/hr. (depending on hrs used) +$5* or $8*/hr telecom and $.15/page printed offline |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RESORS - Remote Sensing On-line Retreival System | 1,3 | 1,2,3 | 1 | contains information pertaining to instrumentation techniques & applications of remote sensing, photogrammetry and change analysis | Canada Centre for Remote Sensing EMR, Ottawa | same as source | E,F | 1 | 1971 (1930) | 26,000 records as of Nov./80 [400-500 records added per month] | | In-house users no charge. Outside users are charged for connect time |
| Research Libraries Information Network | 1 | 1,2,3 | 1 | MARC records from over 50 academic, public & special libraries - 1972 to present | BALLOTS network libraries & Library of Congress | ? | E | 4 | 1972 | 16,000,000 records as of Oct./78 [daily updates] | | $24*/hr. for searching catalogue cards $4/card; 25¢/search/month, mthly. Mag. tapes of Catalog records in MARCII format 0-500 records -$34* |
| RETRO LDSIS | 3 | 1,2,3 | 1 | Scienfic and technical reports pertaining to defence | Directorate of Scientific Information Services National Defense Canada, Ottawa | Same as source | E, F | 1 | 1969 | 75,000 records [annual growth 5,000 records] | | In-house |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Revised Statutes of Canada - RSC [Fr.: SRC lea statuts revisés du Canada] | 1,2 3 | 1,2,3 | 1 | office consolidation of the Revised Statutes of Canada | Federal Dept. of Justice, Ottawa | QL Systems, Ottawa | E, F | 4 | | 14,868 records as of Nov.18/80 [irregular updates to July 1/1979 | | $2/sign-on, $2/search, $2/1000 lines printed off-line |
| RILM (Repertoir Internation de Literature Musicale | 1 | 1,2,3 | 1 | international database containing abstracts of significiant literature on music | City Univ. of N.Y., Intl RLM Center, N.Y. | DIALOG Lockheed | E | 3 | 1972 | 13,700 records [3 times yearly updating of 1,500 records] | | $50*-$60*/hr. & 15¢/offline record in format 5 plus $5 or $8/hr. telecom costs |
| RSO - Statutes of Ontario | 2 | 1,2,3 | 1 | Contains full text of provincial statutes and amendments of Ontario that are currently in effect. Corresponds to printed publication STATUTES OF ONTARIO | Dept. of Justice, Ontario | QL Systems | E | 4 | | 110 statutes [Updated annually] | | 2.00/sign-on 2.00/search 2.00/1,000 lines printed off-line |
| SAE Abstracts - Society of Automotive Engineers, Inc. | 1 | 1,2,3 | 1 | covers papers concerned with self-propelled vehicles, applicable to the aerospace, transportation & automobile industries | Society of Automobile Engineers, Inc., U.K. | INFOMART, Toronto | E | 1 | Jan. 1965 | 11,235 records [quarterly updates of 800 records] | | $80*/hr. plus $8*/hr.telecom costs Offline prints are 15¢ per record SDI=$5/update |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Safety (Safety Science Abstracts) | 1 | 1,2,3 | 1 | international database devoted to the science of safety | Cambridge Scientific Abstracts, Inc. Center for Safety N.Y. Univ. | INFOMART, Toronto | E | 1 | June 1975 | 59,321 records [bimonthly updating] | | $75*/hr. plus 15¢/offline print. Plus $8/hr. telecom costs |
| SALUS | | | | covers literature on low-cost rural health care and health manpower training in developing countries | Internatl Development Research Centre, Ottawa | Same as source | E | 3 | 1970 | 7,111 records as of Feb./81 [weekly updates] | | |
| Science Citation Index - Scisearch | 1 | 1,2,3 | 1 | multidisciplinary index to the literature of science and technology | Institute for Scientific Information Philadelphia, PA | DIALOG Lockheed | E | 4 | | 2,700,000 records [mthly updates of 42,000 records] | | Since 1978: Subscribers: $15*-$30*/hr. 15¢/record Non-subscribers: $105*-$120*/hr $.25/record |
| Sdiline | 1 | 1,2,3 | 1 | current month of Medline, searchable separately each month for purposes of current awareness | U.S. Natn'l Lib. of Medicine State Univ. of N.Y. | C.I.S.T.I. | E | 4 | | 21,397 records as of Oct./79 [mthly updates of 20,000 records] | | $15*-$8*/hr. (depending on hours used) 15¢/page for offline prints +$5*-$10*/hr telecom charge |

REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SPIN - Searchable Physics Information Notices | 1 | 1,2,3 | 1 | current indexing and abstracting of the journals and conference proceedings published by the American Institute of Physics | American Inst. of Physics, N.Y. | DIALOG Lockheed | E | 4 | 1975 | 104,000 records [mthly updates of 2,000 records] | | $20*-$35*/hr. +$5* or $*x/hr telecom. Off-line prints are 10¢/record |
| SWR Selected Water Resources Abstracts | 1 | 1,2,3 | 1 | world science & technical literature covering water related aspects of the life, physical & social sciences | Water Resources Scientific Center, U.S. Dept. of the Interior | QL Systems, Ottawa | E | 1,3 | 1975 | 54,659 records as of Nov.18/80 [mthly updates] | | $2/sign-on $2/search & $2/1000 words printed offline |
| Serline | 1 | 1,2,3 | 1 | Union List of Serials held by major medical libraries in the U.S. - made available to Canadians in Nov./77. Also include conferences | U.S. Nat. Library of Medicine, State Univ. of N.Y. | C.I.S.T.I. | E | 4 | | 33,426 records as of Oct./79 | | $15 or $8/hr. (depending on hrs. of use) 15¢/page of offline print + $5-$10/hr. telecom. charge |
| SITICE Système informatique de traitement de l'information de la carte écologique de la Baie James | 1 | 1,2,3 | 1 | Inventory of bio-physical information on the James Bay territory | Société de développement de la Baie James Montréal | Same as source | F | 1 | 1979 (1973) | 36,000 records [annual growth 1%-10%] | | variable |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Smithsonian Science Information Exchange - SMIE | 1 | 1,2,3 | 1 | citations to current research projects in all areas of life - social, physical, behavioral and engineering sciences | Smithsonian Science Information Exchange, Wash. DC | BRS - | E | 1,3 | 1977 | [monthly updates of 9000 records] | | $30*/hr. plus $.10/ off-line citation +$5.50/hr telecom costs |
| Smithsonian Science Information Exchange - SSIE | 1 | 1,2,3 | 1 | citations to current research projects in all areas of life - social, physical, behavioral and engineering sciences | Smithsonian Science Information Exchange, Wash., D.C. | INFOMART Toronto | E | 1,3 | 1974 | 561,132 records [monthly updates of 9000 records] | | $110*/hr. plus $8/hr telecom. costs off-line prints are $.25/ record |
| Smithsonian Science Information Exchange - SSIE | 1 | 1,2,3 | 1 | citations to current research projects in all areas of life - social, physical, behavioral and engineering sciences | Smithsonian Science Information Exchange, Wash., D.C. | DIALOG Lockheed | E | 1,3 | | 253,000 records [mthly updates] | | $63x-$78x/hr. +$5 or $8/hr. telecom. Off-line prints are 20¢/record |
| Social Scisearch | 1 | 1,2,3 | 1 | (social science abstracts and citations) | Institute For Scientific Information Philadel-phia, PA | DIALOG Lockheed | E | 3 | 1972 | 700,000 records [mthly updates of 9000 records] | | $55x-$70x/hr. +$5 or $8/hr. telecom costs Offline prints are $.10/ record |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sociological Abstracts | 1 | 1,2,3 | 1 | in-depth coverage of Sociology and related Social Sciences areas, from Sociological Abstracts Inc. | Socio-logical Abstracts, Inc. San Diego | DIALOG Lockheed, Palo Alto, CA | E | 3 | Jan. 1973 | 103,007 records as of Nov./80 [updated 5 times annually with 1500 records per update] | | $40*-$50*/hr. +$5* or $8*/hr telecom costs Offline prints are $.10/ record |
| SOL - Solid Waste Management | 1,2 3 | 1,2,3 | 1 | references to completed or ongoing solid waste mana-gement recovery and utilization projects - record includes project description, results, costs, personnel involved. | Enviro-mental Protection Service, Fisheries & Environment Canada | QL Systems, Ottawa | E, F | 1 | 1970 | 214 records as of Nov.18/80 [annual updates] | | $2/sign-on $2/search $2/1000 words, printed lines offline |
| SPK - Speakers Ruling of the House of Commons Fr.: DLO-Déci-sions de l'Ora-teur | 1,2 | 1,2,3 | 1 | contains questions of priviledge, points of order, practices & procedures governing the daily debates in the House of Commons, as ruled by the Speaker. | House of Commons, Canada | QL Systems, Ottawa | E, F | 4 | Oct. 15, 1974 to June 29, 1976 | 50 records as of Nov./80 | | $2/sign-on $2/search $2/1000 lines printed offline |
| SPORT - (Sport & Recreation Index) (also known as SIRC) | 1,3 | 1,2,3 | 1 | covers journal material in the areas of sport, recreation, sport medicine & physical education from 1975 to date | Sport Information Resource Centre, Ottawa | INFOMART, Toronto | E | (4) | 1975 (1949) | 52,167 records | | $70*/hr plus $.15/offline print $8*/hr. telecom. SDI= $4.50*/update |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSCI - Social Science Citation Index | 1 | 1,2,3 | 1 | extensive coverage of the journal literature and cited references in the social sciences - (1,600 journals indexed cover to cover) | ISI Philadelphia, U.S. | INFOMART, Toronto | E | 3 | | 4,805,698 records [weekly updates] | | $70*/hr. plus $.10/ offline prints $8*/hr telecom costs |
| SPRAYING FILE (application and technology) | 3 | 1,2,3 | 1 | technical aspects of applying agricultural sprays | Agriculture Canada | Agriculture Canada Research Station Saskatoon | E | 1 | 1970 (1950's) | 5,000 records updating monthly ext. annual growth 200 records | current years | (in-house use) |
| Standard & Poors News | 1 | 1,2,3 | 1 | extensive coverage incl. financial reports on more than 9,000 companies in the U.S. in which there any degree of public interest | Standard & Poors Corp. N.Y. | DIALOG Lockheed | E | 2 | Sept. 1979 | 88,000 records as of Oct./80 [1,700 records per weekly update] | | $70*-$85*/hr. +$5* or $8*/hr telecom costs $.15/full record printed offline |
| STO Standing Orders of the House of Commons | 1,2 | 1,2,3 | 1 | Standing Orders of the House of Commons. Procedural rules as decided upon and approved by the members. | House of Commons, Canada | QL Systems Ltd., Ottawa | E, F See Seeley P.25 | 4 | Jan. 1976 | 302 records as of Nov.18/80 [irregularly updated] | | $2/sign-on $2/search $2/1,000 lines printed offline |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IHSP - State Publications Index | 1 | 1,2,3 | 1 | Single most comprehensive source of current state documents issued by the 50 states, Puerto Rico and the Virgin Islands (on virtually every topic) | BRS - Scotia, N.Y. | Same as source | E | 2,3 4 | 1976 | 50,000 records as of Dec./80 [qusrterly updates of 1,500 records] | | $20*/hr plus $5.50*/hr. telecom. costs |
| SOR - Statutory Orders and Regulations | 1 | 1,2,3 | 1 | contains selected federal regulations with amendments to Aug. 31/80 | | QL Systems Ltd., Ottawa | E | 4 | | to August 31, 1981 (not complete) | | $2/sign-on $2/search $2/1000 lines printed offline |
| SAC Statutes of Alberta Citator | 1 | 1,2,3 | 1 | contains refences to judicial decisions concerning Alberta Statutes | Canadian Law Info. Council and Univ. of Calgary Library | QL Systems Ltd., Ottawa | E | 4 | 1970 to 1979 | 199 records as of Nov.18/80 [irregularly updated] | | $2/sign-on $2/search $2/1000 lines printed offline |
| SBC Statutes of British Columbia | 1,2 3 | 1,2,3 | 1 | an official consolidation of the Statutes of British Columbia | Attorney-General's Dept., Province of B.C. | QL Systems Ltd., Ottawa | E | 4 | 1974 to Dec.31 1979 | 18,416 records as of Nov.18/80 bi-annually | | $2/sign-on $2/search $2/1000 lines printed offline |
| SMC Statutes of Manitoba | 1 | 1,2,3 | 1 | contains reference to judicial decisions concerning Manitoba statutes Each reference includes a brief summary of relevant ruling. | | QL Systems Ltd., Ottawa | E | 4 | 1970 | 2,555 records as of Nov./80 [irregularly updated] | | $2/sign-on $2/search $2/1000 lines printed offline |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SNB - Statutes of New Brunswick | 1,2 3 | 1,2,3 | 1 | an official consolidation of all the statutes of New Brunswick in effect since November 1976 | Attorney-General's Dept. Prov. of N.B. | QL Systems Ltd., Ottawa | E | 4 | 1975 | [annually irregular updates] | | $2/sign-on $2/search $2/1,000 lines printed offline |
| SRS - Statuts Revisés du Canada | 2,3 | 1,2,3 | 1 | Full text of Canadian Acts or Statutes on force in the French languages | Federal Department of Justice Ottawa | QL Systems Ltd., Ottawa | E, F | 4 | 1969 (1969) | 10,000 records [irregular updating] | | $2/sign-on $2/search $2/1,000 lines printed offline |
| STP - (Scientific and Technical Policies) | 1,3 | 1,2,3 | 1 | currently contains science info. policy statements, studies & commentaries as they apply to Canada | Faculty of Library Science, U of Alta. | University of Alberta, Edmonton | E | 1 | 1960 | 553 records as of Aug./79 [irregular updates] [annual growth 75 records] | | Univ. of Alberta computing charges |
| Surface Coatings Abstracts | 1 | 1,2,3 | 1 | contains references to literature on all aspects of paint and surface coatings | Paint Research Association of Great Britain | DIALOG Lockheed | E | 1 | | 31,500 records as of May/80 [mthly updates of 700 records] | | $50*-$65*/hr. + telecom. costs of $5* or $8*/hr Off-line prints are 15¢/full record |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SWERP (Solar and Wind Energy Research Program) | 1,3 | 1,2,3 | 1 | bibliographic database of technical and non-technical publications relating to solar and wind energy | Alberta Research Council, Edmonton | Univ. of Alberta, Edmonton | E | 1 | 1977 (1975) | 3,401 records as of Feb./81 [semiannual updates, annual growth, 1,200 records] | | see fee shedule for Univ. of Alberta |
| TAR Tax Advance Rulings | 1,2 | 1,2,3 | 1 | income tax rulings published by the Deputy Minsiter of National Revenue for the Taxation of Canada | Deputy Minister of National Revenue | QL Systems Ltd., Ottawa | E | 4 | | 79 records as of Nov.18/80 | | $2/sign-on $2/search $2/1,000 lines printed offline |
| Tech Briefs | 1 | 1,2,3 | 1 | contains selected technical & management articles that are potentially useful to medium sized Cdn. manu-facturing industry | Technical Information Service, C.I.S.T.I. | same as source | E | 2 | 1965 | 33,000 records as of June/80 [mthly batch updating] | | no charge for info. search $2.20/article for supplying document |
| TITUS | 1 | 1,2,3 | 1 | covers fields of textiles and textile-related materials | Institut Textile de France | INFOMART, Toronto | E | 2 | Jan. 1970 | 109,476 records | | $85*/hr & 20¢/ offline print plus telecon. costs from $8*/hr. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TOXBACK | 1 | 1,2,3 | 1 | contains material entered into TOXLINE before 1974 & has the Hayes File which covers material on pesticides from 1930-1970 | U.S. Nat'l Library of Medicine Bethesda, MD | C.I.S.T.I. | E | 1 | 1940 | 379,299 records as of Feb./79 | | $15* or $8*/hr (depending on hours of use) &15¢/page of offline print +$5*-$10*/hr. telecom. an additional $1/search + 18¢/offline |
| TOXBACK 74 | 1 | 1,2,3 | 1 | contains material entered into TOXLINE from 1974 to 1976 inclusive | U.S. Nat'l Library of Medicine | C.I.S.T.I., Ottawa | E,F | (1) 4 | Jan./74 to Dec./76 | 275,605 records as of Dec./80 | | same as above except + 45¢/offline |
| Toxicology Data Bank - TDB | 1 | 1,2,3 | 1 | toxicology facts & data selected from standard reference textbooks reviewed by peer committee of scientists compounds chosen because of known or potential toxicity | U.S. Nat'l Library of Medicine | C.I.S.T.I., Ottawa | E,F | (1) 4 | | 2,547 records as of Dec./80 [quarterly updates] | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tox line | 1 | 1,2,3 | 1 | contains 8 discrete files dealing with toxicology, chemistry, pollution, pharmaceuticals, pesticides mutagens, teratology | U.S. Nat'l Medical Library, (with Chemical Abstract Services, Bibliographies Info.Servs. Am.Soc. of Hosp. Pharmacists, Oak Ridge Nat. Labs, Env. Prot.Agency | C.I.S.T.I. | E,F | 1 | 1974 to 1978 | 67,000 records as of Feb./80 [bimonthly updates of 1,000 records] | | $15* or $8*/hr (depending on hours of use) +15¢/page of offline print &$5*-$8*/hr. telecom costs an additional $3.20/hr. +18¢ /hit printed offline |
| TRIS | 1 | 1,2,3 | 1 | a composite file dealing with the planning, development, operation & performance of transportation systems | U.S. Dept. of Transport | DIALOG Lockheed | E | 2 | 1964 | 100,000 records as of Mar./80 [monthly updates of 1,500 records] | | $25*-$40*/hr. +$5* or $8*/hr telecom costs offline prints are $.10/full record printed offline |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TCSA Initial Inventory | 1 | 1,2,3 | 1 | a non-bibliographic dictionary listing of chemical substances derived from the Initial Inventory of Toxic Substances Control Act (TSCA) Chemical Substances Inventory | Industry Assistance Office, Environmt'l Protection Agency, U.S. | DIALOG Lockheed | E | 1 | | 43,278 records as of June/79 | | $30*-$40*/hr. +$5* or $8*/hr telecom costs. offline prints are 10¢/ citation for offline prints in full format |
| TUVAALUK | 1 | 1,2,3 | 1 | prehistoric archeology of the artic | Program Tuvaaluk Laboratoire d'archéologie U.Q.A.M. | same as source | E, F | 1,3 | 1973 | 4,500 records [annual growth 3-400 records] | | |
| Tulsa (Petroleum Abstracts) | 1 | 1,2,3 | 1 | covers all aspects of oil | Univ. of Tulsa, Okla. | INFOMART, Toronto | E | 1 | Jan. 1965 | 218,073 records [mthly update of 1,250 records] | | Subscribers: $75*/hr & 15¢/ office record Holders of a minor search license. |
| U.S. International Air Traffic Stats. | 1 | 1,2,3 | 1 | contains information on passenger traffic on all flights originating or terminating in the U.S. (statistical data base?) | U.S. Dept. of Transp. w/Dept. of Justice | I.P. Sharp Associates Ltd., Toronto | E | (2) 5 | 1975 | [mthly updates] | | current Sharp APL time-sharing charges |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| USPSD U.S. Political Science Documents | 1 | 1,2,3 | 1 | in-depth coverage of 120 U.S. political science journals | Univ. Center for Int'l Studies, Univ. of Pittsburgh | INFORMART, Toronto | E | 3 | 1975 | 12,518 records [quarterly updates of 750 records] | | $65*/hr & 15¢/ offline print Plus $8*/ telecom. SDI= $5*/update |
| USPSD U.S. Political Science Documents | 1 | 1,2,3 | 1 | in-depth coverage of 120 U.S. political science journals | Univ. Center for Int'l Studies of the Univ.of Pittsburgh | DIALOG Lockheed | E | 3 | 1975 | 5,300 records [quarterly updates of 900 records] | | $50*-$65*/hr.& 15¢/offline print plus $5* or $8*/hr. telecom. costs |
| U.S. Public School Directory | 1 | 1,2,3 | 1 | includes directory-type data on public elementary and secondary schools in the U.S. & territories | National Center for Education Statistics Wash., DC | DIALOG Lockheed | E | 4 | | 80,000 records as of Feb./80 [completely revised annually] | | $20*-$35*/hr. +telecom costs of $5* or $8* /hr. Offline prints are 10¢ /full record |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNESCO | 1 | 1,2,3 | 1 | provides worldwide coverage of literature written by and for UNESCO | UNESCO, Paris, France | IDRC - Ottawa | E | 2,3 | 1970 | 25,000 records as of Feb./81 [quarterly updates] | | All IDRC data bases are available on an experimental basis for government, academic and non-profit institutions |
| UNIDO - United Nations Industrial Development Organization | 1 | 1,2,3 | 1 | covers documents prepared by or for UNIDO concerned with the improvement of industry in developing countries | UNIDO, Vienna, Austria | IDRC - Ottawa | E | 2 | 1968 | 9,795 records as of Feb./81 [biannual updates] | | All IDRC data bases are available on an experimental basis for government, academic and non-profit institutions |
| UNION - Union List of Scientific Serials in Canadians Libraries | 1 | 1,2,3 | 1 | a listing of titles representing the serial holdings (journals, etc. of 263 libraries | National Research Council, Ottawa | C.I.S.T.I., Ottawa | E,F | 4 | | 49,261 records as of Nov./80 [mthly updates of 140 titles] | | $40/hr. plus 35¢/offline citation |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UPI - United Press International | 1 | 1,2,3 | 1 | a demonstration database of the full text of the UPI Wire Service for May 21,24, and 29, 1979 | United Presa Inter-national | QL Systems Ltd., Ottawa | E | 4,5 | | 6,274 records as of Mar./80 | | $2/sign-on $2/search $2/1000 lines printed offline |
| URBADOQ - | 1,3 | 1,2,3 | 1 | contains French language articles on all aspects of urban affairs | Informatech France/ Quebec Montreal | same as source | F | 3 | 1976 | 7,500 records as of Dec./80 [annual updates] | | $40/hr. in Quebec, $70/hr.outside Quebec |
| USCA - U.S. Contract Awards | 1 | 1,2,3 | 1 | references to more than 8000 awards by U.S. gov't to both public and private sector contractors | Washington Represen-tative Services | INFOMART, Toronto | E | 5 | | 13,433 records [mthly updates to 1978] | | $85*/hr. +15¢/ record printed offline Also $8*/hr telecom costs |
| Vetdoc | 1 | 1,2,3 | 1 | Veternary Literature Documentation | (Derwent Public'ns Ltd.,London England) | INFOMART, Toronto | E | 4 | 1968 | - | | $100*/hr. +5x-$10x/hr. telecom. costs 13¢/offline citation |
| Votes | 1 | 1,2,3 | 1 | covers complete results of roll call voting by members of U.S. Congress | U.S.? | INFOMART, Toronto | E | 4 | | [bimonthly updates] | | $90x/hr plus $8X/hr telecom costs Offline prints are 15¢ /full record |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weekly Criminal Bulletin - WCB | 1 | 1,2,3 | 1 | bulletins of judgements in criminal cases received by Canada Law Book Ltd. | Canada Law Book Ltd. | QL Systems Ottawa | E | 4 | Oct. 27, 1976 to Oct. 31, 1980 | 4,993 records as of Nov.18/80 [weekly updates] | | $2/sign-on $2/search $2/1,000 lines printed off-line Surcharge of $3/search |
| Weldasearch | 1 | 1,2,3 | 1 | covers all aspects of the joining of metals and plastics in variety of international journals and other sources | The Welding Institute, Abington, Cambridge, England | Lockheed Information Retreival Service, Palo Alto,CA | E | 1 | 1967 | 47,200 records [mthly updates] | | $50*-$65*/hr. +$5* or $8*/hr telecom costs offline printe are $.15/full record |
| Western Weekly Reports - WWR | 1,2 | 1,2,3 | 1 | contains headnotes of Western Weekly Reports from 1968, Vol. 62 to 1978, Vol. 4, inclusive | Carswell Company Ltd. Canada | QL Systems Ltd., | E | 3? 4? | - | 6,579 decisions 6,464 records [updated irregularly] | | $2/sign-on, $2/search, $2/1,000 lines printed offline |
| World Aluminum Abstracts - WAA | 1 | 1,2,3 | 1 | covers world technical literature and patents on aluminum, ranging from ore processing to end use | American Society for Metals, Metals Park Ohio | Lockheed Information Retreival Service, Palo Alto,CA | E | 1 | Jan. 1968 | 66,200 records as of Nov.18/80 [monthly updates of 550 records] | | $35*-$50*/hr. +$5* or $8*/hr telecom costs $.10/record printed offline |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| World Aluminum Abstracts - WAA | 1 | 1,2,3 | 1 | covers world technical literature and patents on aluminum, ranging from ore processing to end use | American Society for Metals, Metals Park Ohio | QL Systems Ltd., Ottawa | E | 1. | 1968 | 74,717 records [mthly updates] | | $2/sign-on $2/search $2/1,000 lines printed offline |
| World Patents Index | 1 | 1,2,3 | 1 | file consists of World Patents Index, World Patents Abstracts, and Central Patents Index | Derwent Publications, Ltd. London, England | INFOMART Toronto | E | 1 | 1970 | 1,708,074 records [mthly updates] | | $100*/hr. for subscribers, & $125*/hr. for non-subscribers +$8*/hr. telecom costs |
| COAL - World Coal Data Base | 3 | 1,2,3 | 1 | relating to all aspects of coal | International Energy Agency London, England | C.I.S.T.I. | E, F | 1 | 1977 | 30,000 records [annual growth 5,000, mthly updates] | | CAM/OLE charges |
| World Textile Abstracts | 1 | 1,2,3 | 1 | Summarizes world literature published in English that is relevant to textile technologists & technical management | Shirley Institute, Manchester, England | Lockheed Information Retrieval Service, Palo Alto, CA | E | 1 | 1970 | 81,000 records [mthly updates of 800 records] | | $40*-$55*/hr. +$5*or$8*/hr. telecom costs Offline prints are 10¢/record |
| YKB - Yukon Bibliography | 1,3 | 1,2,3 | 1 | contains articles, monographs, theses, reports, papers, etc. concerning Yukon Territory | Boreal Institute for Northern Studies Edmonton | QL Sytems Ltd., Ottawa | E, F | 3 | 1975 (1971) | 1,338 records as of Nov.18/80 [annual growth 400; bi-annual updates] | | $2/sign-on $2/search $2/1,000 lines printed offline |

(This is the end of the section on online bibliographic and textual databases).

## REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

(Numeric)*

| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Accident Analysis File | 1 | 1,2,3 | 1,2 | contains data pertaining to all accidents that occurred in Edmonton, Alberta (a data file) | Systems Planning Section, City of Edmonton | City Hall, Edmonton, Alberta | E | 3 | Jan. 1971 | 25,000 records as of Dec./80 [mthly updates of 2,200 records] | | Magnetic Tape preparation time plus cost of run |
| Accounting and Budgeting Data | 2 | 1,2 | 2 | Details of all receivables and expenditures plus encumbrance data - includes tax and water revenues. Administration reports. | Toronto Finance Dept. Organization and Methods Division | Same as source | E | 2 | | [daily updates] | | |
| ACT - Actuarial | 1,2 | 1,2,3 | 2 | currently comprised of primitive mortality information on insured lives, annuitants & the general population taken from over 200 population tables | I.P. Sharp Associates Ltd., Toronto | same as source | E | 3 | 1950 to 1972 | 120 records as of Aug. 1977 [irregular updates] | | current Sharp APL Time-Sharing charges |

* Note: The last section of this appendix contains a listing of numeric or statistical databases which are either available online or as datafiles on magnetic tape. Unlike the reference databases, it is not uncommon where numerical datasets are concerned to obtain a copy on magnetic tape and analyze and use the data on one's own computer utilizing an available software packages for statistical analysis.

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| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AIC - Agricultural Input Costs | 3 | 1,2,3 | 2 | stores and updates continuously the prices of agricultural input items (60) in 5 regions. | British Columbia Ministry of Agriculture Victoria, B.C. | I.P. Sharp Ass. Ltd. Toronto | E | 1,2 | 1978 (1979) | 8,000 records [annual growth 10,000 monthly updates] | | current I.P. Sharp pricing schedule |
| Agdata Agricultural Commodities Data Base | 1,2 3 | 1,2,3 | 2 | contains time series data, mainly of price and volume info., on a number of key agricultural commodities | Economic Serv's Div. Alberta Agriculture Edmonton | I.P. Sharp Associates Ltd., Ottawa | E | 2 | 1961 | 300 series [weekly updates] | | current Sharp APL Time-Sharing Charges |
| American English Vowels - Peterson and Barney study (U. of Alta.) | 1,2 | 1,2,3 | 2 | consists of new individual data reported in the Peterson & Barney study | H.E. Barney & G.E. Peterson | Univ. of Alberta, Edmonton | E | 3 | 1951 | | | no charge |
| Arterial Roadway Inventory File | 1 | 1,2,3 | 1 | contains a collection of information relating to arterial roadways | Systems Planning Section, City of Edmonton | City Hall Edmonton | E | 1 | Jan. 1971 | 2,550 records as of Dec./80 | | preparation time and cost of run. |
| Australian Bureau of Statistics - | 1 | 1,2,3 | 2 | a database of over 1500 financial and economic timeseries relating to Australia | Australian Bureau of Statistics | I.P. Sharp Associates Ltd., Toronto | E | 2 | 1953 | 1,500 records as of Feb./81 [quarterly updates] | | current Sharp APL Time-Sharing Costs |

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(Numeric)

| NAME | REP | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Canadian Land Inventory | 1 | 1,2,3 | 2 | an online computer graphics system for displaying data from the Canada Land Inventory Database | Alberta Environment Edmonton | same as source | E | 3 | - | 368 maps (37 maps per subject area) | | $50/hour |
| Canadian Economic Forecasts - National Forecasting Service | 1 | 1,2,3 | 2 | consists of time series containing forecasts of the Canadian economy | INFOR-METRICA Ltd Ottawa | I.P. Sharp Associates Ltd., Toronto | E | 2 | Jan.1967 to 1977 | 2,500 records as of Aug.77 [irregular updates] | | Current Sharp APL Time-Sharing |
| CANSIM Cross-Classification System | 1 | 1,2,3 | 2 | Cross-sectional data pertaining to social & welfare characteristics of the Canadian population | CANSIM Stats. Canada, Ottawa | same as source | E | 3 | | [yearly updates] | | Computer-related costs at Stats. Can. |
| CANSIM Cross-Classified System | 1,2 | 1,2,3 | 2 | Cross-sectional data pertaining to social & welfare characteristics of the Canadian population | CANSIM Stats. Canada, Ottawa | Datacrown Ltd., Ottawa | E | 3 | | [yearly updates] | | Computer related costs at Stats. Can. DataCrown |
| CANSIM Mainbase | 1,2 | 1,2,3 | 2 | Socio-economic time series relating to the internal activities and to the external trade of Canada | CANSIM Stats. Canada, Ottawa | Datacrown Ltd., Ottawa | E | 2,3 | 1914 | 260,000 records [daily updates] | | Computer related costs at Datacrown |

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(Numeric)

| NAME | REF | FUNC-TIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CFIS - Canadian Fertilizer Information System | 3 | 1,2,3 | 2 | Fertilizer shipments - Canada, U.S. offshore | Canadian Fertilizer Institute, Ottawa | Same as source | E | 1,2 | 1975 (1973) | 100,000 records [annual growth 5,000, quarterly updates] | | variable |
| CANSIM Mainbase | 1,2 | 1,2,3 | 2 | Socio-economic time series relating to the internal activities and to the external trade of Canada | CANSIM Stats. Canada Ottawa | CANSIM Current Economic Analysis Division Stats. Canada | E | 2,3 | 1914 | - | | Computer-related costs at Stats. Canada |
| CANSIM Minibase | 1,2 | 1,2,3 | 2 | subset of CANSIM (as above) | CANSIM Current Economic Analysis Div., Stats. Canada | Datacrown Ltd., Ottawa | E | 2,3 | 1946 | 45,000 records as of Oct./79 [daily updates] | | Computer-related costs at Datacrown Ltd. |
| CANSIM Minibase | 1,2 | 1,2,3 | 2 | contains monthly, quarterly, & annual series of significant interest to economic researchers in Canada | CANSIM Stats. Canada, Ottawa | same as source | E | 2 | 1914 | 25,000 records as of Oct./79 [daily updates] | | Cost varies by distributor |
| CANSIM Minibase | 1,2 | 1,2,3 | 2 | subset of CANSIM, (as above) | CANSIM Stats. Canada, Ottawa | I.P. Sharp Associates Ltd., Toronto | E | 2,3 | Jan.1946 to 1977 | 45,000 records as of Aug./79 [daily updates] | | Current Sharp APL Time-Sharing charges |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Clinical Information on Hemophilia | 3 | 1,2,3 | 1,2 | Clinical information/ treatment of hemophiliacs being served in Central and South-Western Ontario | Dr. Martin Inwood St.Joseph's Hospital London, England | Same as source | E | 4 | 1980 (1978) | 150 people [updated daily/ weekly] | | determined by requirements |
| Chartered Banks & the Bank of Canada | 1 | 1,2,3 | 2 | 4 databases containing information on Canadian chartered banks & the Bank of Canada, including monthly assets & liabilities quarterly & yearly revenues & expenses: Bank of Canada weekly statistics etc. | Stats, Canada Ottawa | I.P. Sharp Associates Ltd., Toronto | E | 2 | 1967 to 1977 | 200,000 records as of Aug./77 [irregular updates] | | current Sharp APL Time-Sharing charges |
| Citibase | 1 | 1,2,3 | 2 | contains some 4000 montly, quarterly, & yearly time-series on a nationa level - economic data | - | Datacrown Inc., Ottawa | E | 2 | 1940 | 4,000 records as of Nov/79 [mthly updates] | | computer-related costs at Datacrown |
| Citizen Participation in Non-Work Time Activities | 1 | 1,2,3 | 1,2 | questionnaire survey dealing with LIP projects, community facilities, and problems related to non-worktime activity (a data file?) | Citizenship Br. Sec. of State | Datacrown Ltd., Ottawa | E | 3 | Jan.1972 to Dec.1972 | 8,688 records as of 1973 | | computer costs plus cost for tapes and document'n |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Civil Aeronautics Board Aviation | 1 | 1,2,3 | 1,2 | consists of extensive data on commercial air carriers U.S. and Canadian | Civil Aeronautics Board, Wash., DC | I.P. Sharp Associates Ltd., Toronto | E | 2 | | 375,000,000 bytes as of Aug./77 | | Current Sharp APL Time-Sharing charges |
| Clinic Client Survey - (City of Edmonton) | 1 | 1,2,3 | 2 | data from survey of randomly selected clients of urban regional public health clinics (a data file?) | P. Craig City of Edmonton Health Dept. | Unviersity of Alberta, Edmonton | E | 3,5 | July to Aug. 1976 | 690 records as of Aug./76 | | reimbursement of cost of transferring information |
| COAL DATA - Coal Analysis (U. of A.) | 1 | 1,2,3 | 2 | a numerical databank of analyses on Alberta coals | Coal Tech. Info.Centre Alberta Research Council | Unviersity of Alberta, Edmonton | E | 1 | - | [irregular updates] | | current charging schedule |
| Commodities | 1 | 1,2,3 | 2 | current & historical price & volume stats. for all commodities traded on the London futures market | Euro-commodities Chart Services Ltd. England | I.P. Sharp Associates Ltd., Toronto | E | 2 | - | 5,000 series (17 megabytes) as of Dec./79 [daily updates] | | subscription free to Euro-charts & current Sharp APL Time-Sharing charge |
| Crime Prevention Through Mass Media: An Evaluation | 1 | 1,2,3 | 1,2 | evaluates the effects of a mass media crime prevention campaign (a data file?) | Dept. of Sociology U. of Alta. Edmonton | University of Alberta, Edmonton | E | 3, (5) | - | 1,031 records from Feb.-Mar./78; 1,288 records from Jan.-Feb./79 | | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cross-National Time Series Data Archive - U. of A. | 1 | 1,2,3 | 1,2 | machine readable format of the Statesmens Yearbook & other sources containing aggregate data (intern'l) (a data file?) | Center for Comparative Political Research, State U. of N.Y. | Univ. of Alberta, Edmonton | E | 3 | 1815 to 1973 | | | |
| Currency Exchange (Cdn. General Electric) | 1 | 1,2,3 | 2 | opening N.Y. market currency rates for the past 90 days (working) for 17 leading countries; closing and period average rates for past 120 months and 25 years | Canadian General Electric | - | E | 2 | 1949 to 1977 | [daily updates] | | regular Mark III Service charges |
| Currency Exchange | 1 | 1,2,3 | 2 | Toronto data as supplied by Bank of Nova Scotia; N.Y. data supplied by the federal Reserve Bank of New York | see description | I.P. Sharp Associates Ltd., Toronto | E | 2 | 1971 to 1977 | 95 records as of Aug./77 [daily & weekly updates] | | Current Sharp APL Time-Sharing Charges |
| Dunskey | 1 | 1,2,3 | 1,2 | info. on some 480,000 individual businesses in Canada | Dun & Bradstreet Canada Ltd. | Datacrown Ltd., Ottawa | E | 2 | 1973 | [twice mthly updates] | | Computer related costs at Datacrown |
| Edmonton Area Study 1977 - U. of A. | 1,2 | 1,2,3 | 1,2 | assess general quality of family and personal life in Edmonton area. (a data file?) | L.W. Kennedy & H.C. Northcott | Univ. of Alberta, Edmonton | E | 3 | Feb. to March 1977 | 341 records [bimonthly updates] | | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Edmonton Area Study 1978 | 1 | 1,2,3 | 1,2 | assess general quality of family and personal life in Edmonton area (a data file?) | Population Research Lab.;Dept. of Sociol. U. of A. | Univ. of Manitoba, Edmonton | E | 3 | Feb. to March 1978 | 452 records as of Feb./79 | | - |
| Edmonton Area Study 1979 | 1 | 1,2,3 | 1,2 | assess general quality of family and personal life in Edmonton area. (a data file?) | Population Research Lab.;Dept. of Sociol. U. of A. | Univ. of Alberta, Edmonton | E | 3 | Feb. to March 1979 | 440 records as of Dec./79 updates] | | — |
| Edmonton Area Study 1980 | 1 | 1,2,3 | 1,2 | assess general quality of family and personal life in Edmonton area (searchible on-line) | Population Research Lab.;Dept. of Sociol. U. of A. | Univ. of Alberta, Edmonton | E | 3 | Feb. to March 1980 | 428 records as of Sept./80 | | U. of A. computer centre charges |
| Electricity Consumption Analysis | 1 | 1,2,3 | 2 | mthly data on electricity sales to 5 consuming sectors by 63 privatley owned U.S. utilities - also, data on weather & econ. factors affecting electricity consumption in each of these utilities service areas | General Electric Mark III Service | same as source | E | 2, (5) | Jan.1971 to 1977 | 1,953 records as of Jan./71 [mthly updates] | | regular Mark III System charges |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ER586 Service Segment Database | 1 | 1,2,1 | 2 | detailed monthly activity across each of the flight segments flown by the certificated U.S. Air route carriers | U.S. Civil Aeronautics Board | I.P. Sharp Associates Ltd., Toronto | E | ? | 1973 | [updated every four months] | | current Sharp APL Time-Sharing costs |
| Federal Trade Commission & Security Exchange | 1 | 1,2,1 | 2 | FTC-SEC quarterly financial estimates represent the aggregates of all enterprises (manufacturers) who file U.S. Corp Income Tax form 1,120 | General Electric Mark III Service | Same as source | E | 2 | 1947 to 1977 | 496 records as of 1976 [quarterly updates] | | normal Mark III Service charges |
| FACT - Facility for the Analysis of Chemical Thermodynamics | 3 | 1,2,1 | 2 | Chemical thermodynamics with emphasis on inorganic compounds | Thermfatt Ltée Montreal | Same as source via McGill Univ. Computing Centre | E | 1 | 1978 (1977) | 1,905 records [annual growth 300 records, annual update] | | 75% of McGill CPU surcharge for industrial users and 25% for non-profit users |
| Financial Post - Stock Prices | 1,2 | 1,2,3 | 2 | contains stock prices from the Cdn., American and N.Y. stock exchanges | Financial Post Computer Services, Toronto | I.P. Sharp Associates, Ltd., Toronto | E | 2 | Sept. 1970 | [daily updates] | | current Sharp APL Time-Sharing Charges |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Financial Post - Fundamental | 1,2 | 1,2,3 | 1,2 | current and historical balance sheets & income account info. on Cdn. & American companies | Financial Post Computer Services, Toronto | I.P. Sharp Associates, Ltd., Toronto | E | 2 | 1959 | [daily updates] | | access fee to Fin. Post ($300/month) plus current Sharp APL Time-Sharing charges |
| Forest Inventory | 3 | 1,2,3 | 1,2 | forest resources inventory including forest stand attributes, growth, analysis | Forestry Branch Sask. Dept. of Tourism and Renewable Resources Prince Albert, Sask. | Northern Systems Centre Sask. | E | 1,2 | 1950 | [annual growth, 10%] | | varies |
| General Plan Review (U. of A.) | 3 | 1,2,3 | 1 | interviews w/residents of 2 Edmonton region towns to ascertain concerns, use & satisfaction w/town services, planning & growth (a data file?) | Edmonton Regional Planning Commission | - | E | 3 | Oct.-Nov. 1979 | 700 records of Dec./79 [irregular updates] | | current charging schedule |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Growth of Alberta Family Study | 1 | 1,2,3 | 1 | to examine what people know believe, & do with regard to fertility, to measure effect of future family planning programs (a data file?) | P. Krishnan & K. Krotki | Univ. of Alberta, Edmonton | E | 3 | Nov. 1973 to Feb. 1974 | 1,045 records as of Feb./79 | | |
| Imports | 1 | 1,2,3 | 1 | data on every shipment of crude oil or petroleum products into the U.S.A. as published by source | American Petroleum Institute | I.P. Sharp Associates, Ltd., Toronto | E | 2 | Jan. 1977 | [mthly updates] | | current Sharp APL Time-sharing costs |
| Infloremetique | 3 | 1,2,3 | 1,2 | vegetation and ecology of region of Richelieu | Departement des sciences biologiques, U.Q.A.M. | Same as source | F | 1,3 | 1975 | 6,000 records [annual growth, 2,000] | | Free |
| Info-Estrie | 3 | 1,2,3 | | economic and regional development (based to a large part on StatsCan data) | Centre de recherche en aménagement régional Univ. de Sherbrooke, P.Q. | Same as source | F | | 1970 | 30 records | | $5/record and analysis |
| International Civil Aviation Organization | 1 | 1,2,3 | 1 | traffic statistics for over 600 airlines & over 300 airports, worldwide | Int'l Civil Aviation Organizat'n Montreal | I.P. Sharp Associates, Ltd., Toronto | E | 7 | 1973 | [annual updates] | | current Sharp APL Time-sharing costs |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| IMF - International Monetary Fund | 1 | 1,2,3 | 1 | international financial statistics from approx. 215 countries | Int'l Monetary Fund, U.S. | I.P. Sharp Associates, Ltd., Toronto | E | 2 | 1948 to 1977 | 20,000 records as of Aug./77 | | current Sharp APL Time-sharing costs |
| IRATE - Eurocurrency Intelsat Rates | 2 | 1,2,3 | 2 | Time series of daily interest rates of international financial transactions made through Eurobanks in London. Date obtained from Financial Times (London). | I.P. Sharpe | I.P. Sharpe | E | 2 | 1980 | [daily updates] | | |
| LANDUP - Alberta Land Use Planning Bank | 3 | 1,2,3 | 1,2 | Canada land inventory capability data for agriculture, forestry, recreation waterfowl and angalates. Also some farmland assessment data for selected areas in Alberta. Covers same range as CLI (Canada Land Inventory). Farmland assessment varies. | Central Services Branch Municipal Affairs, Edmonton | Same as source | E | 1,2 | 1972 | 6,500,000 [annual growth 120,000, updated twice yearly] | | |
| Learning of English Inflections - U. of A. | 1,2 | 1,2,3 | 1 | cross-sectional study of 112 children intended to identify patterns in the learning of English inflexions (a data file?) | Dr. B.L. Derwing & Dr. W.J. Baker | Univ. of Alberta, Edmonton | E | 3 | 1974 to 1975 | 3,000 records as of 1975 | | no charge |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Metal Data File | 1 | 1,2,3 | 1 | basic crystallographic data for metal and intermetallic phases (mixed numeric and bibliographic) | Dr. D.L. Calvert, N.R.C., Ottawa | Same as source | E | 1 | 1913 to 1979 | 4,500 records as of June/80 [yearly updates of 250-300 by batch model] | | charges in certain situation |
| National Bureau of Economic Research Time Series | 1 | 1,2,3 | 1 | a collection of economic & business related stats. from a variety of sources, on income, sales, production, inventories, employment, etc. | National Bureau of Economic Research, U.S. | Canadian Electric | E | 2 | 1947 to 1977 | 3,000 records as of 1977 | | regular Mark III service charges |
| NATES - National Analysis of Trends in Emergencies System | 3 | 1,2,3 | | National inventory of accidents involving spills of a hazardous materials | National Environmental Emergency Centre Environment Canada | I.P.Sharp | E, F | | 1974 | 9,000 records [updated when new info. available] | | current I.P. Sharp charges |
| DRI Capsule National Bureau of Economic Research | 1 | 1,2,3 | 1 | mthly., quarterly, & yearly time series of information relating to the U.S. economy | National Bureau of Economic Research, N.Y. | I.P. Sharp | E | 2 | Jan.1950 to 1977 | 3,000 records as of Aug./77 [mthly updates] | | $100 initiat'n fee & $65/mth accessing charge in addition to current Sharp APL time-sharing charges |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NABD - (National Data Bank) | 2 | 1,2,3 | 2 | Data on newspaper reader-ship collected by telephone interviews and demographic info. on each respondent. Data currently available for much of Ontario and Winnipeg, eventually to be conducted throughout Canada. | Newspaper Marketing Bureau and Southam Newspapers | Interactive Market Systems TELMAR MEDIA SYSTEMS LTD. | E | 5 | | | | |
| National Planning Assn. Economic Data | 1 | 1,2,3 | 1 | yearly timeseries of economic data for U.S. economy | National Planning Assoc'n | I.P. Sharp Associates, Ltd., Toronto | E | 2 | 1967 | 180,000 records as of Feb./81 [annual updates] | | same as above |
| (NAQUADAT) National Water Quality Data | 1 | 1,2,3 | 1 | info. relating to chemical, phisical & biological analysis of surfance and ground water | Water Quality Br, Inland Watera Directorate Ottawa | same as source | E | 1 | 1960 | [batch updated every 2 months] | | coat recovery basis for outside users |
| Nepean Township Test Area | 3 | 1,2,3 | 2 | land information necessary to derive qualitative and quantitative erosional characteristics | Collins & Moon Ltd. Guelph | same as source | E | 1,2 | 1979 (1976) | 500,000 records | | ? |
| National Registry of Hemophiliacs | 3 | 1,2,3 | 1,2 | Basic data on type of hemophilia, place and type of care | Canadian Hemophilia Society Hamilton | same as source | E | 4 | 1977 | 2,000 persons [annual growth, 6%-10%; quarterly updates] | | determined by nature of query |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NEWSCOST | 2 | 1,2,3 | 2 | A newspaper advertising estimating system designed to aid advertisers in estimating costs and likely effectiveness of advertising in Canadian daily newspapers. Includes line rates, volume discounts, colour charges, populations for city, and circulation by city. | Canadian Daily Newspaper Publisher's Association | Telmar Media Systems Inc. | E | 2,5 | | [updated periodically] | | |
| Official Airline Guide Database | 1 | 1,2,3 | 1 | summary of mthly schedules of all direct flights throughout the world | Official Airline Guide, Inc. | I.P. Sharp Associates, Inc., Toronto | E | 5(?) | Sept. 1978 | 300,000 records as of Nov./78 [mthly updates] | | surcharge to Off. Airline Guides plus current Sharp APL Time-sharing charge |
| Original and Destination | 1 | 1,2,3 | 1 | continuous survey perfomed by the CAB of the itineraries of 10% of all passengers travelling on U.S. Certified Carriers | U.S. Civil Aeronautics Board | I.P. Sharp Associates, Ltd., Toronto | E | 5(?) | 1973 | [quarterly updates] | | current Sharp APL Time-sharing charges |
| Outdoor Recreation in The Yukon | 1,2 | 1,2,3 | 2 | data on outdoor recreation activity patterns of persons living in the Yukon (a data file?) | T.L Burton Dept. of Rec. Admin. U. of A. | Dept. of Sociology, U. of A. | E | 3 | April-May 1977 | 811 records as of Oct./78 | | - |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Personnel and manning file | 2 | 1,2 | 2 | salaries, deductions, employee skills, total ataffing for all civic departments. Management, public administration. Administrative reporta, aurveys | Toronto Finance Dept. of Organiza-tiona and Methods Division | Same as source | E | 2 | | | | |
| Petroleum Data System | 1 | 1,2,3 | 2 | extensive info. on petroleum around the world - by reservoira | Univ. of Okla. | Canadian General Electric | E | 1 | - | - | | regular Mark III aervice charges |
| Petroseries | 1 | 1,2,3 | 2 | time series data on production, stocka, imports aupply & demand of crude oil & petroleum products in the U.S. | American Petroleum Institute & the U.S. Dept. of Energy | I.P. Sharp Assocites, Ltd., Toronto | E | 1 | 1972 | 5 Megabytea as of Dec.31/79 [weekly updates] | | current Sharp APL Time-sharing charges |
| Physical Property Data System | 1 | 1,2,3 | 2 | program for the determina-tion of the physical properties of aingle com-ponent or multi-component streams | Institute of Chemical Engineering England | Canadian General Electric | E | 1 | | 500 recorda aa of 1976 | | regular Mark III aervice charges |
| PSSDB - Power System Simulation Data Base | 3 | 1,2,3 | 2 | data used to perform load flow and dynamic aimulation studies | Manitoba Hydro Winnipeg | Same aa source | E | 1 | 1979 (1968) | 400 Megabytea | | ? |

## REPORT ON PUBLIC ON-LINE INFORMATION SERVICES

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| NAME | REF | FUNCTIONS | DATA TYPE | DESCRIPTION OF KEY SERVICES | SOURCE | VENDOR | LANGUAGE | FOCUS | STARTING DATE | SIZE OF DATABASE (as of Jan. 80 unless indicated) | VOLUME/ACTIVITY | COSTS/REVENUES |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CDS - Producer's Consensus costs of Production Data | 3 | 1,2,3 | 2 | Contains costs of producing agricultural commodities in B.C. | B.C. Ministry of Agriculture Victoria, B.C. | Same as source via B.C. Systems Corporation, Victoria | E | 1,2 | 1976 | 50 commodities | | current B.C. systems price schedule |
| Roadways Maintenance Inventory File | 1 | 1,2,3 | 1,2 | a collection of information relating to existing roadways in the City of Edmonton | Engineering Dept., Corporate Systems Section, Edmonton | - | E | 1 | Jan. 1975 to 1977 | 1,500 records as of Mar./80 [yearly updates] | | preparation time and cost of run |
| Securities | 1 | 1,2,3 | 1 | Daily, weekly, monthly, & selected historical earnings for longer periods for most U.S. & Canadian Issues | Canadian General Electric | same as source | E | 2 | Jan.1975 to 1977 | 40,000 records as of Aug./77 | | 5¢/issue retrieved +$17/hr. |
| SPIR - Search Program for Infrared Spectra | 3 | 1,2,3 | 2 | Catalogue of infrared spectra | American Society for Testing and Materials Philadelphia | C.I.S.T.I. | E | 1 | up to 1972 | 140,000 records [data base is static] | | under revision |
| SECURITIES - (Formerly Financial Post Databank) | 2 | 1,2,3 | 2 | Stock exchange data from all Canadian, New York, and American exchanges. Daily volume, high low, closing price data, etc. | Financial Post, Investment Databank | I.P. Sharp Associates | E | 2 | | [daily update] | | |

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| Solids Transport for Mobile Boundary Channels - U. of A. | 1 | 1,2,3 | 1 | dsta related to transportation in flumes, canals and rivers. Prepared in cooperation with Environment Canada (a dats file?) | R.F. Howells A.W. Peterson, Canada | University of Alberta | E | | 1900 to 1972 | - | | $200 for complete data set on tape |
| Standard Industrial Classification | 1 | 1,2,3 | 1 | time series covering value, shipments, capital expenditures, value added, cost of materials, # of employees, # of production workers, payroll, wages, manhours & year end inventories | U.S. Dept. of Commerce Social and Economic Stats. Div. | Canadian General Electric | E | 2 | 1958 to 1976 | 5,260 records | | regular Mark III service charges |
| Streets Inventory | 2 | 1,2,3 | 2 | Field observations, surveys (Toronto Public Works Dept.). Data on street, pavement, curb conditions, data on sewers and water mains, traffic volume, lanes, etc. | Toronto Finance Dept., Organization and Methods Division | Same as source | E | 1 | | | | |
| Study of Human Adjustment in Fort McMurray | 1 | 1,2,3 | 1 | examination of the impact of rapid industrialization in a rural area (a data file?) | Alberta Oil Sands Environmental Research Program | same as source | E | 3 | May-June 1979 | 430 records as of Dec./79 [irregular updates] | | current charging schedule |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Surface Water Data | 1,2 | 1,2,3 | 1 | over 80,000 station-years of daily discharges, water levels & sediment data by 7 Regional offices across Canada | Environ-ment Canada, Ottawa | same as source | E | 1 | 1908 to 1979 | [annual updates] | | mostly off-line Tapes to be supplied by requestor |
| Traffic Volume Count File | 1 | 1,2,3 | 2 | data on traffic flow at selected locations (a data file?) | Transport'n Systems Design Dept Systems Planning Section City of Edmonton | same as source | E | 2 | Jan. 1972 | 2,000 records as of Dec./79 [yearly updates] | | preparation time and cost of run |
| Transit Inventory File | 1 | 1,2,3 | 2 | boarding and alighting transit surveys (a data file?) | Systems Planning Section, City of Edmonton | same as source | E | 1,2,3 | Jan. 1974 | 27,000 records as of Dec./79 [irregular updates] | | preparation time and cost of run |
| Transit Station Count File | 1 | 1,2,3 | 2 | contains transit station count information (a data file?) | Systems Planning Section, Edmonton | - | E | 1,2,3 | Jan. 1974 | 10,000 records as of Dec./79 [twice yearly updates] | | preparation time and cost of run |

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| Transportation Maintenance Auxiliary Inventory File | 1,2 | 1,2,3 | 2 | information relating to auxiliary structure such as walkways, retaining walls, steps, guard rails, utility lot walks, etc. (a data file?) | Engineering Dept., Corporate Systems Section, Edmonton | - | E | 1 | Jan.1975 to 1977 | 1,200 records as of Mar./80 [yearly updates] | | preparation time and cost of run |
| TSE Indexhist (TSE 300) | 2 | 1,2,3 | 2 | Trading indexes data for 62 major and minor indexes traded on the Toronto Stock Exchange, as well as the "TSE 300" composite index. | Toronto Stock Exchange | I.P. Sharp Associates | E | 2 | | [daily updates] | | |
| T6 Air Charter | 1 | 1,2,3 | 2 | details on all charter flights that fly within the United States, or in/out of the United States | National Archive & Record Services, Wash., DC | I.P. Sharp Associates Ltd., Toronto | E | 5 | June 1976 | 45 Megabytes as of Dec./79 [mthly updates] | | current Sharp APL Time-Sharing charges |
| U.K. Central Stat. Office Macro-Economic Databank | 1 | 1,2,3 | 2 | time series of a variety of economic and statistical areas in the United Kingdom | United Kingdom Civil Service | I.P. Sharp Associates Ltd., Toronto | E | 2 | 1948 | 2,000 series [mthly updates] | | current Sharp APL Time-Sharing Charges |
| U.S. Consumer Price Index | 1 | 1,2,3 | 2 | contains series relating to the cost of living in the U.S. | - | I.P. Sharp Associates Ltd., Toronto | E | 5 | 1935 | 8,000 records as of Feb./81 | | current Sharp APL Time-Sharing Charges |

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| United States Regional Data Bank | 1 | 1,2,3 | 2 | time series covering economic factors for the 50 states, territorial U.S., and the nine census regions | U.S. Dept. of Commerce Edison Electrical Institute | Canadian General Electric | E | 2 | 1947 to 1977 | [yearly updates] | | regular Mark III Service charges |
| Women and Physical Recreation: A Causal Analysis | 1,2 | 1,2,3 | 2 | study of active sports participation among 1200 British and Canadian women (a data file?) | Dr. M.A. Hall Univ. of Alberta, Edmonton | | E | 3 | 1972 to 1973 | | | no charge |
| WATENIS - Water Effluent National Information Inventory System | 3 | 1,2,3 | 1,2 | Water effluent information in municipal and industrial sectors | Water Pollution Control Directorate Environment Canada | Same as source | E | 1 | 1976 | 3,000 municipalities and 500 industrial plants | | users pay amputing costs |
| WATGAIS - Waterloo Geotechnical Automated Information System | 3 | 1,2,3 | 1,2 | Borehole data for the Regional Municipality of Waterloo | Department of Civil Engineering Waterloo, Ontario | Same as source | E | 1 | 1977 (1940-1977) | 11,000 records | | $1.25/unit used on VM/CMS |

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| 1961, '66, '71, and '76 Census of Canada Summary Tapes - U. of A. | 1,2 | 1,2,3 | 2 | Cdn population data from the last 4 census - 1961, '66, '71 and '76 (data files) | Stats. Canada | Univ. of Alberta, Edmonton | E | 3 | June 1, 1976 | | | $25 basic charge plus programming & computer costs |
| 1971 Census Place of Work-Univ. of Alberta | 1,2 | 1,2,3 | 2 | 1971 Canada Census data re: place of work (a data file) | Stats. Canada | Univ. of Alberta, Edmonton | E | 3 | June 1, 1971 | 140,725 records as of June 1977 | | $25 basic charge plus programming & computer costs |
| 1971 Census of Canada - Public Use Sample | 1,2 | 1,2,3 | 2 | data for all provinces except P.E.I. & Territories Data for only 1 in 100 persons (a data file) | Stats. Canada | Univ. of Alberta, Edmonton | E | 3 | June 1, 1971 | | | charge plus programming & computer costs |
| 1971 Census of Canada - Enumeration Area Data Series | 1,2 | 1,2,3 | 2 | 965 demogrsphic, housing, family, ethnic, migration, and economic variables from 8,250 enumeration areas in the Prairie Provinces (a data file) | Geology Dept., U. of Calgary | same as source | E | 3 | April, 1971 | | | charges at U. of Calgary Computing Centre |
| 1971 Census of Canada, Place of Work, Census Tract, Montreal | 1,2 | 1,2,3 | 2 | place of work for persons resident in Montreal | Stats. Canada, Ottawa | Univ. of Alberta, Edmonton | E | 3 | June 1971 | 362,665 records as of June/77 | | $25 basic charge plus programming and computer costs |

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| 1971 Census of Canada, Place of Work, Census Tract, Toronto | 1,2 | 1,2,3 | 2 | cross-sectional info. on housing, family, household and population to census tract level, for Toronto metropolitan area (a data file) | Stats. Canada, Ottawa | I.P. Sharp Ass., Ltd., Toronto | E | 3 | June 1971 | 362,665 records as of June/77 | | current Sharp APL Time-Sharing rates plus small amount charges for offline data |
| 1971 Census of Canada, Place of Work, Census Tract, Toronto | 1,2 | 1,2,3 | 2 | place of work for persons resident in the City of Toronto | Stats. Canada, Ottawa | Univ. of Alberta, Edmonton | E | 3 | June 1971 | 217,533 records as of June/77 | | $25 basic charge plus programming and computer costs |

KNOPPERS, JAKE V. TH.
--Report on public online...



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